

The COSMOS/PEER-LL Geotechnical Virtual Data Center (GVDC)

Carl Stepp, COSMOS (PI)

Jean Benoit, UNH

John Bobbit, POSC

Dan Ponti, USGS

Charles Real, CGS

Jennifer Swift, USC

Loren Turner, Caltrans

Workshop on the Implementation of COSMOS/PEER-LL GVDC

Memphis, Tennessee

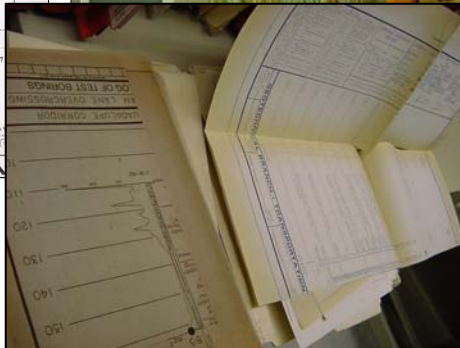
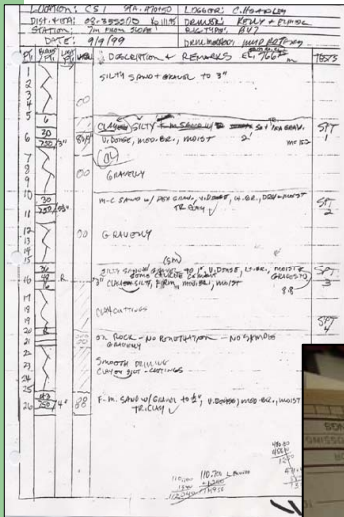
October 5-6, 2005

Overview

- Motivation for new data management tools
- Project 2L01
- Project 2L02
- Project 2L03
- The GVDC – How does it work?

Geotechnical Data Management

- Many organizations are paper-based.
- Need more efficient information systems.



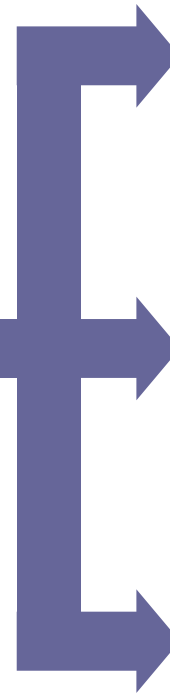
Vision: Single Agency



Data is collected in the field electronically



Data files are transferred to a central repository



Design Engineer



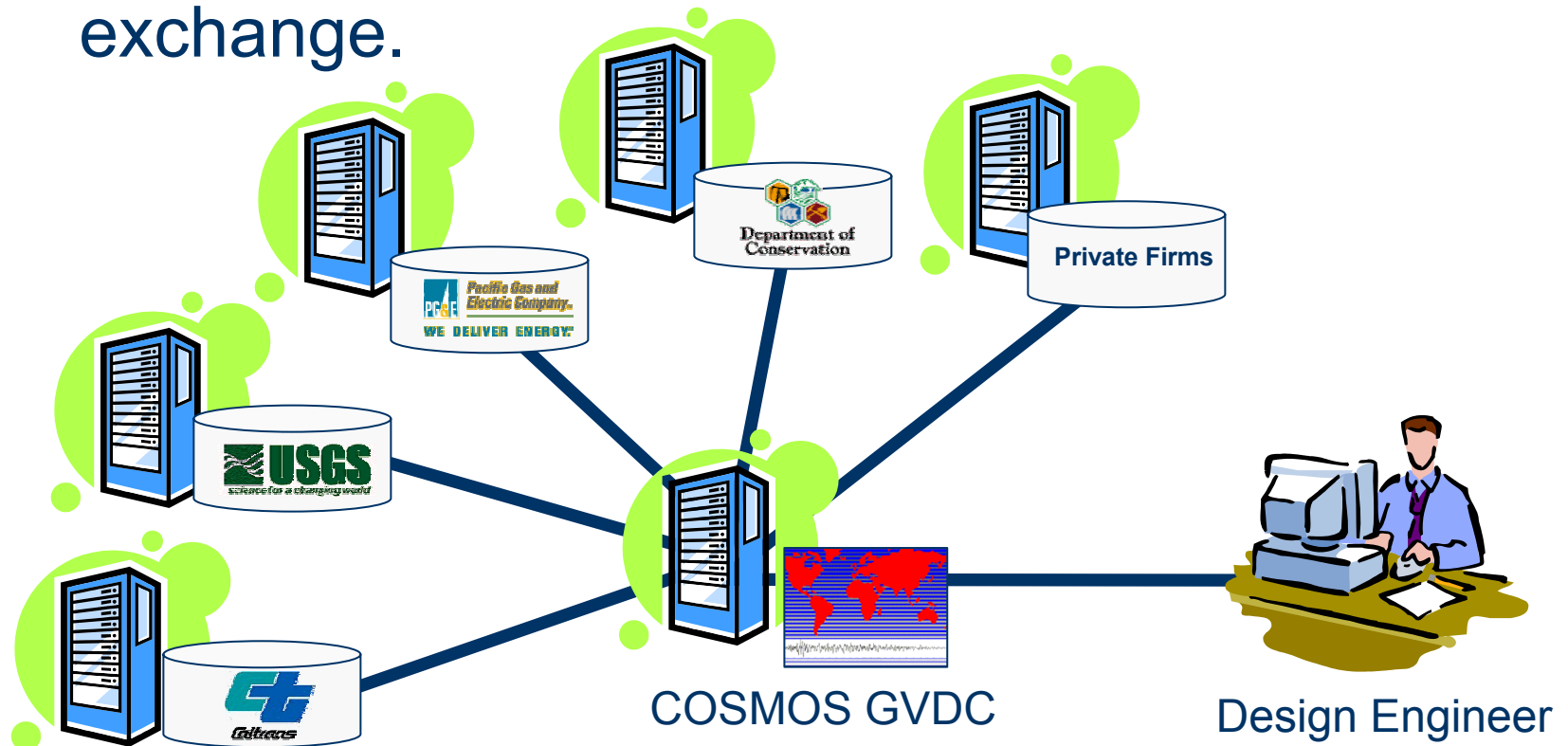
Drafter



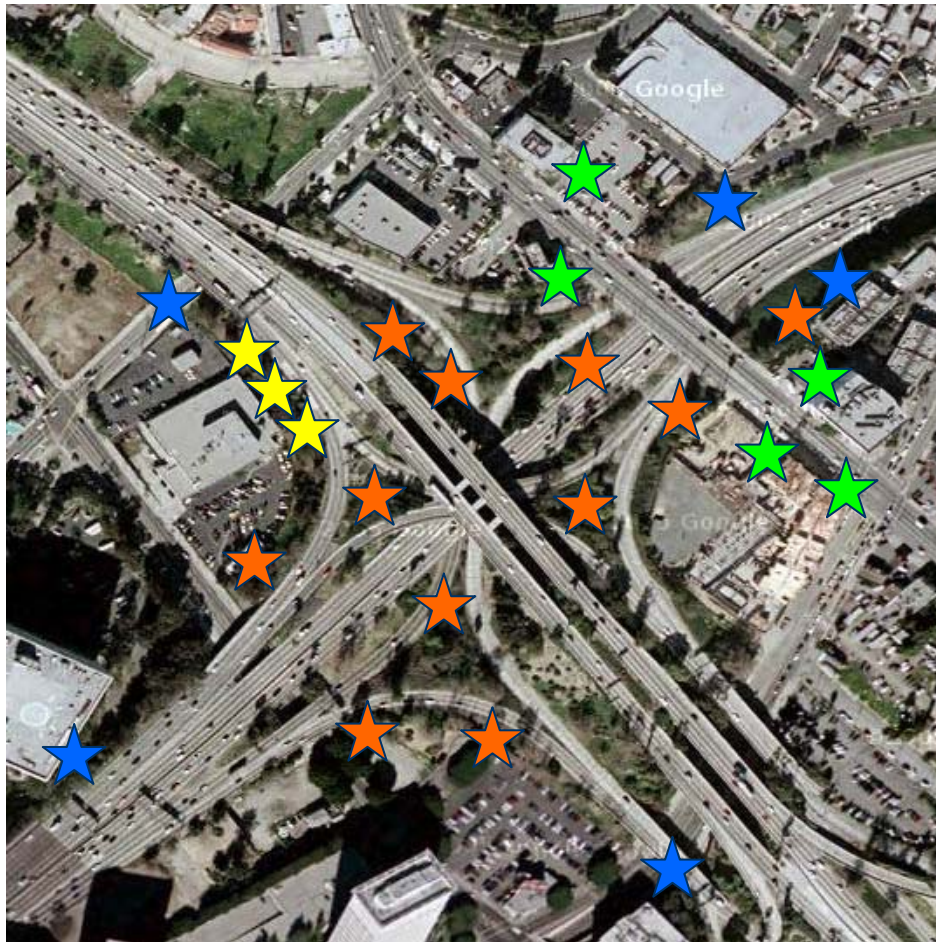
Other Staff

Vision: Multiple Agencies

- Partner agencies benefit through data exchange.



Vision: Multiple Agencies



Background of “2L” Projects

- 1992 NSF/FHWA sponsors the National Geotechnical Experiment Sites.
- 1996 The ROSRINE project pioneers web dissemination of geotechnical data.
- 1998 USC Workshop highlights growing need for geotechnical data management and exchange.
- 1999 PEER Lifelines initiates Project 2L01.**
- 2001 Project 2L01 – Held a workshop to assess user needs and build consensus to develop a Geotechnical Virtual Data Center (GVDC).**
- 2004 Project 2L02 – Unveiled a pilot GVDC that demonstrated the feasibility of the technology.**
- 2005 Project 2L03 – Initiated.**

Project 2L01 – Plan for a Geotechnical Virtual Data Center

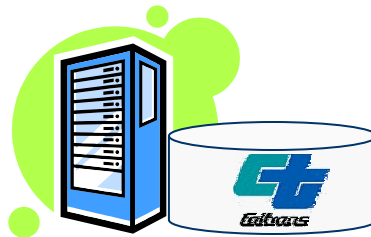
- Flexible and extensible
- Translation-based system
- Central index, single portal to data – not a central repository
- Data quality
- Data exchange standards
- Control of data and attribution
- Security and liability

Project 2L02 – Develop a Pilot Geotechnical Virtual Data Center

- Developed a pilot web-based center for dissemination of geotechnical data from multiple linked geotechnical database archives.

GVDC – How Does It Work?

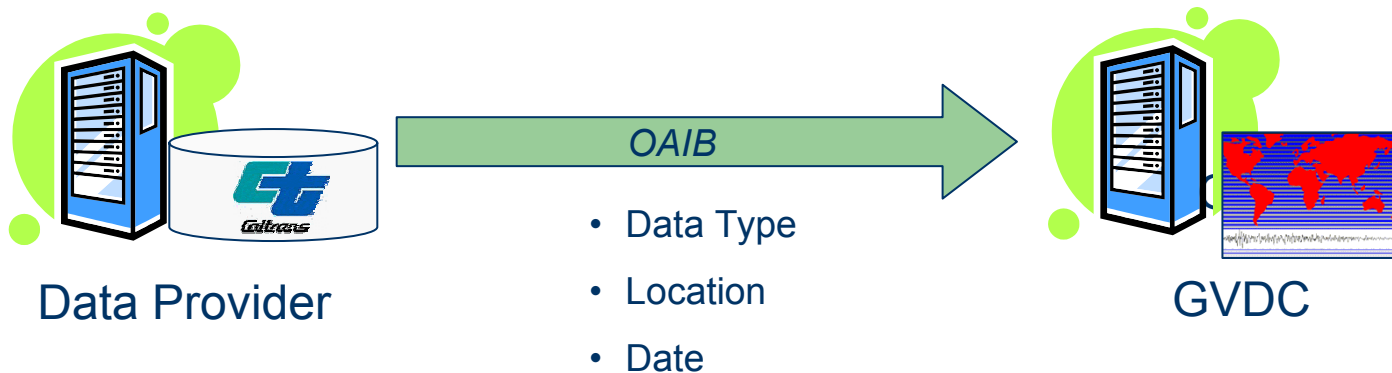
- First, the data provider needs to have a digital repository of their data.
- The data repository can take on many forms.



Data Provider

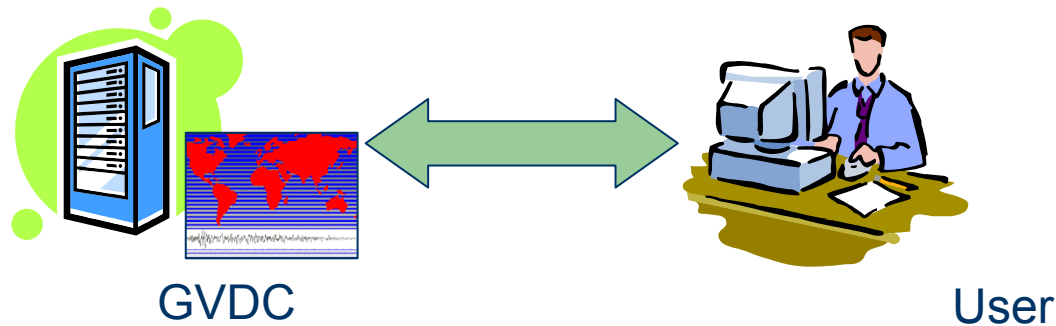
GVDC – How Does It Work?

- The Data Provider communicates information to the GVDC about it's data repository using OAIB.
- The GVDC maintains a small database that stores an index to what data the Data Provider has (similar to a card catalog at a library).
- The GVDC *does not* store the data itself – only it's metadata.



GVDC – How Does It Work?

- A user goes the GVDC to search or browse for the availability of data.



GVDC – How Does It Work?

https://geodata.cosmos-data.org/CustomerDataMap_v2.htm? - Microsoft Internet Explorer

Address: https://geodata.cosmos-data.org/CustomerDataMap_v2.htm?

IDENTIFY THE SEARCH AREA BY MAP Use the ARROW tool (cursor) to click and drag a rectangular search area, or enter the boundaries of the search area in the form to the right. Use ZOOM and PAN tools for navigation.

Scale: 51,528

Longitude Boundaries (decimal degrees):

Latitude Boundaries (decimal degrees):

Visible: ☒ Cities, ☒ Urban Boundaries, ☒ Counties, ☒ Roads, ☒ Streets, ☒ Lakes, ☒ Rivers, ☐ Shaded Relief, ☐ USGS Topo Quads

Active: ☒ Cities, ☒ Urban Boundaries, ☒ Counties, ☒ Roads, ☒ Streets, ☒ Lakes, ☒ Rivers, ☐ Shaded Relief, ☐ USGS Topo Quads

Filter Search Results:

DATA TYPES

☐ Find all data sets

☒ Specify data sets to search

DATES OF INVESTIGATION

☒ Find all dates

☐ Specify a range of dates (MM/DD/YYYY)

FROM TO

TOTAL BOREHOLE DEPTH

☒ Find all borehole depths

☐ Specify a range of borehole depths

MIN MAX

GIS by Paragon Geographics

COSMOS/PEER-LL - Microsoft Internet Explorer

Address: https://geodata.cosmos-data.org/CustomerDocSearchResult.asp

California Department of Transportation

| VDC Record ID (1) | Project (2) | Hole (3) | Data Type (4) | Project Date (5) | Updated (6) | Contact (7) | Downloads (8) |
|-------------------------|------------------------------|----------|---------------|------------------|-------------|--------------|---|
| 10112000_07053351_00403 | Caltrans Site for GVDC Pilot | CPT-4 | CPT | 2000-10-11 | 2000-10-11 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 10112000_07053351_00404 | Caltrans Site for GVDC Pilot | CPT-3 | CPT | 2000-10-11 | 2000-10-11 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 10122000_07023141_00405 | Caltrans Site for GVDC Pilot | CPT-1 | CPT | 2000-10-12 | 2000-10-12 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
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| 10122000_07023141_00410 | Caltrans Site for GVDC Pilot | CPT-7 | CPT | 2000-10-12 | 2000-10-12 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 10202000_07496101_00427 | Caltrans Site for GVDC Pilot | CPT-5 | CPT | 2000-10-20 | 2000-05-03 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 10252000_07002491_00448 | Caltrans Site for GVDC Pilot | CPT-6 | CPT | 2000-10-25 | 2000-10-25 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
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| 11282000_07008341_00483 | Caltrans Site for GVDC Pilot | CPT-10 | CPT | 2000-11-28 | 2000-11-28 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 11282000_07008341_00483 | Caltrans Site for GVDC Pilot | CPT-10 | CPT | 2000-11-28 | 2000-11-28 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 11292000_07002301_00488 | Caltrans Site for GVDC Pilot | CPT-1 | CPT | 2000-11-29 | 2000-10-12 | Loren Turner | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

Download Data from this Provider

United States Geological Survey

| VDC Record ID (1) | Project (2) | Hole (3) | Data Type (4) | Project Date (5) | Updated (6) | Contact (7) | Downloads (8) |
|-------------------|---------------------|----------|---------------|------------------|-------------|--------------|---|
| VDC_122 | 352N P | 39574 | DGC | 2000-10-31 | 2004-10-12 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| VDC_123 | 351AA | 39575 | DGC | 2000-10-30 | 2004-10-12 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| VDC_124 | 361AP | 39576 | DGC | 2000-10-30 | 2004-10-12 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| VDC_125 | 382AQ AR AS | 39577 | DGC | 2000-12-12 | 2004-10-12 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| VDC_2225 | Long Beach - Pier C | 14 | MSC | 2000-11-14 | 2004-12-17 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| VDC_2225 | Long Beach - Pier C | 14 | DGC | 2000-11-14 | 2004-12-17 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| VDC_513 | 351AC AD AE AF | 78 | DGC | 2000-11-08 | 2004-10-12 | Daniel Ponti | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

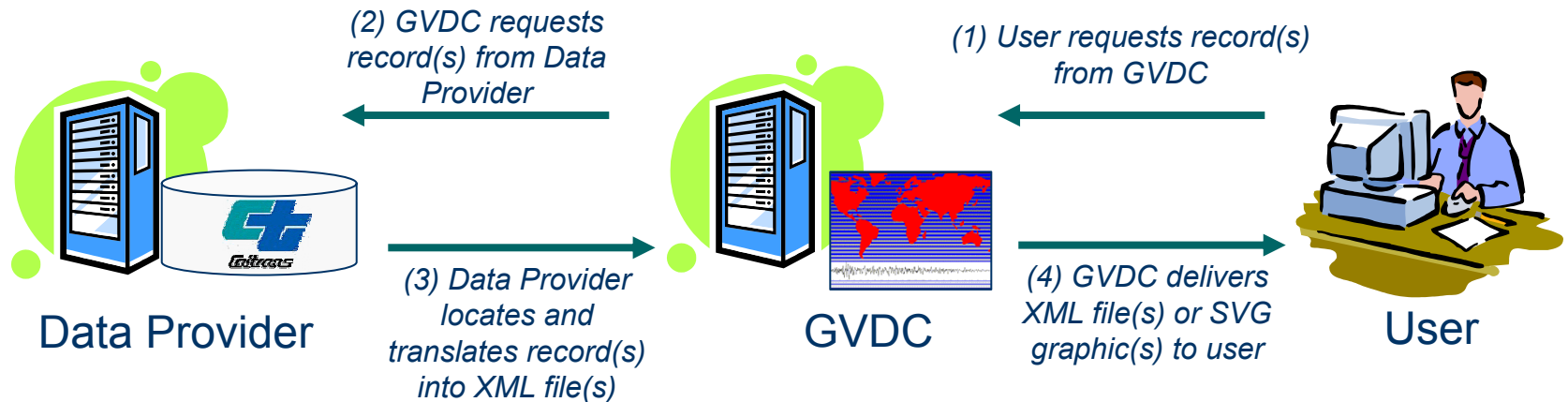
Download Data from this Provider

(1) VDC Record ID - Unique ID used by the Virtual Data Center.
 (2) Project - name from the data provider.
 (3) Hole Name - name used by the data provider.
 (4) Data Type - three letter data type code.
 (5) Project Date - original date of data collection.
 (6) Last Updated - date that data sets were digitized or modified.
 (7) Contact - Contact for provide data.
 (8) Downloads - check boxes to indicate the type of file you would like to download.

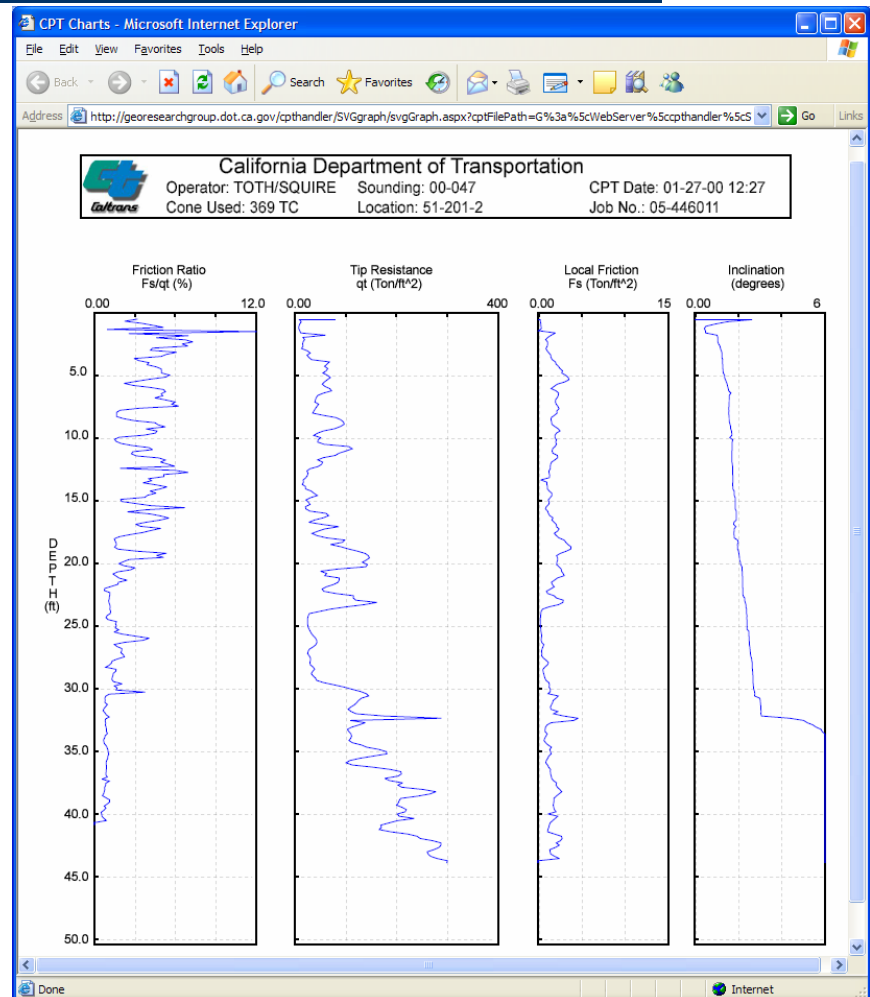
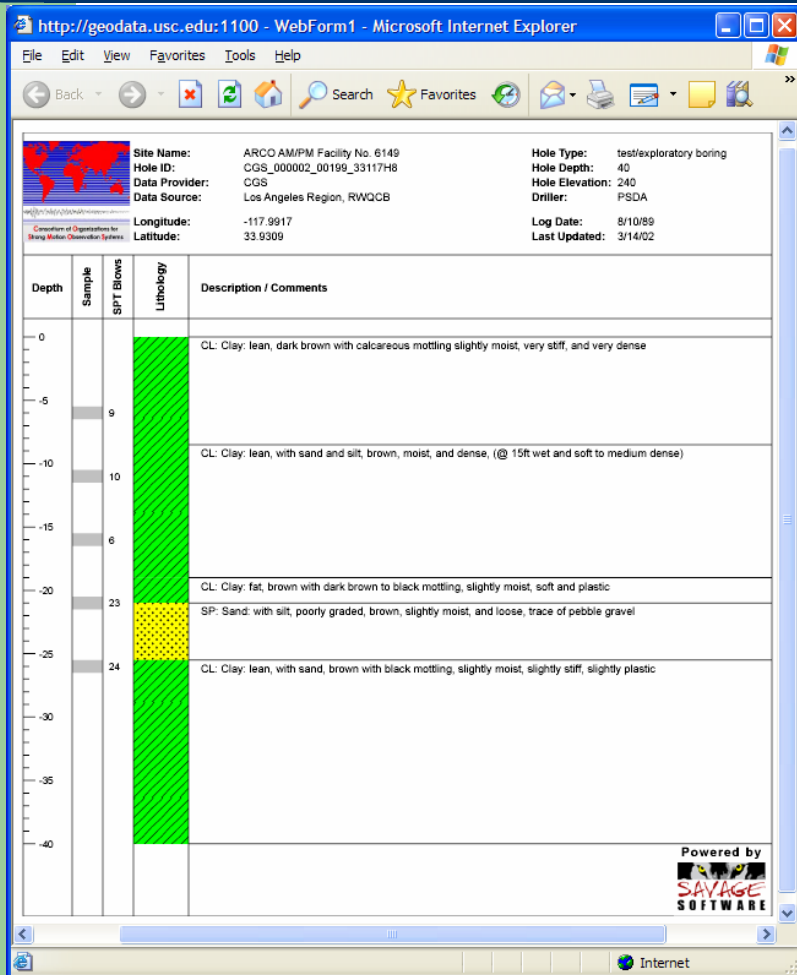
< new search

GVDC – How Does It Work?

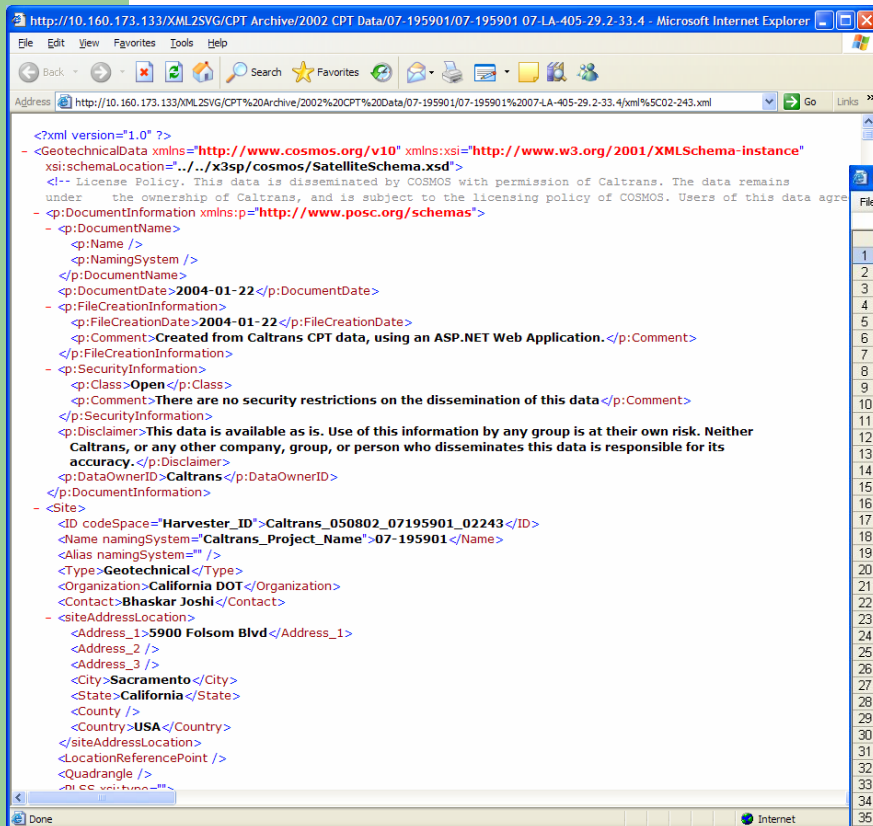
- The user requests to download and/or preview the record(s) returned by the search process.



GVDC – How Does It Work?



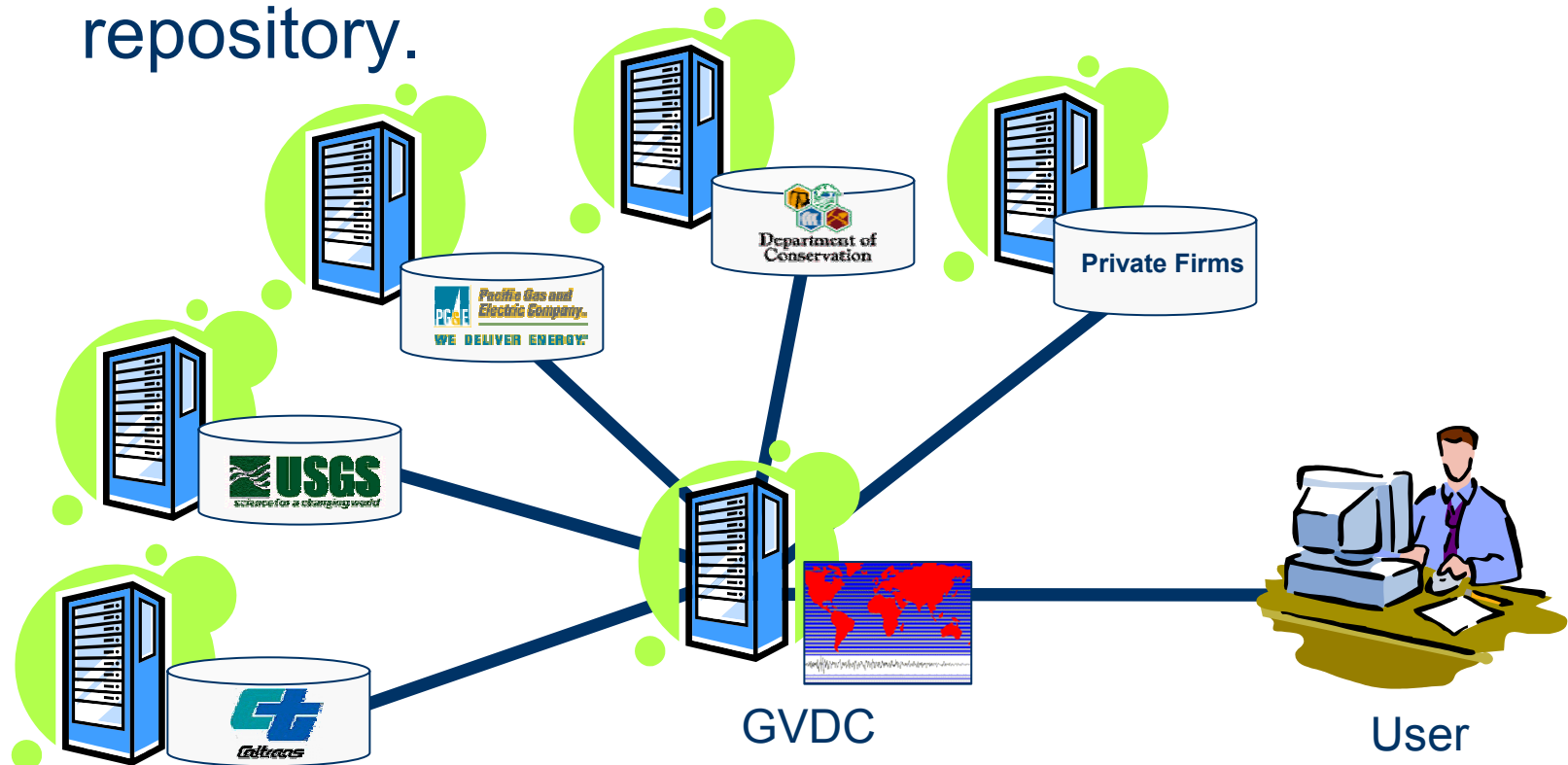
GVDC – How Does It Work?



| ID | CODE | SPAHOLE_ID | CORE_ID | SOURCE | TOP | TOP_UOM | TOP_QUA | BASE | BASE_UO | BASE_QU | CLASS | SYSTEM | PRIMARY | SECONDARY | SECONDARY |
|-------|---------------|------------|---------|--------|---------|---------|---------|---------|---------|---------|------------|----------------------|---------|-----------|-----------|
| 38495 | USGS_FOQUS_ID | | | | 0 ft | | | 128 ft | | | USGS FOCUS | unknown/not observed | | | |
| 38497 | USGS_FOQUS_ID | | | | 128 ft | | | 155 ft | | | USGS FOCUS | clay | | | |
| 38498 | USGS_FOQUS_ID | | | | 155 ft | | | 175 ft | | | USGS FOCUS | sand | | | |
| 38499 | USGS_FOQUS_ID | | | | 175 ft | | | 225 ft | | | USGS FOCUS | clay | | | |
| 38500 | USGS_FOQUS_ID | | | | 225 ft | | | 249 ft | | | USGS FOCUS | sand | | | |
| 38501 | USGS_FOQUS_ID | | | | 249 ft | | | 1008 ft | | | USGS FOCUS | shale | | | |
| 38502 | USGS_FOQUS_ID | | | | 1008 ft | | | 1032 ft | | | USGS FOCUS | sandstone | | | |
| 38503 | USGS_FOQUS_ID | | | | 1032 ft | | | 1170 ft | | | USGS FOCUS | shale | | | |
| 38504 | USGS_FOQUS_ID | | | | 1170 ft | | | 1180 ft | | | USGS FOCUS | sandstone | | | |
| 38505 | USGS_FOQUS_ID | | | | 1180 ft | | | 1636 ft | | | USGS FOCUS | shale | | | |
| 38506 | USGS_FOQUS_ID | | | | 1636 ft | | | 1641 ft | | | USGS FOCUS | sandstone | | | |
| 38507 | USGS_FOQUS_ID | | | | 1641 ft | | | 1648 ft | | | USGS FOCUS | shale | | | |
| 38508 | USGS_FOQUS_ID | | | | 1648 ft | | | 1671 ft | | | USGS FOCUS | sandstone | | | |
| 38509 | USGS_FOQUS_ID | | | | 1671 ft | | | 1680 ft | | | USGS FOCUS | shale | | | |
| 38510 | USGS_FOQUS_ID | | | | 1680 ft | | | 1684 ft | | | USGS FOCUS | sandstone | | | |
| 38511 | USGS_FOQUS_ID | | | | 1684 ft | | | 1718 ft | | | USGS FOCUS | shale | | | |
| 38512 | USGS_FOQUS_ID | | | | 1718 ft | | | 1770 ft | | | USGS FOCUS | sandstone | | | |
| 38513 | USGS_FOQUS_ID | | | | 1770 ft | | | 1777 ft | | | USGS FOCUS | shale | | | |
| 38514 | USGS_FOQUS_ID | | | | 1777 ft | | | 1805 ft | | | USGS FOCUS | sandstone | | | |
| 38515 | USGS_FOQUS_ID | | | | 1805 ft | | | 1860 ft | | | USGS FOCUS | shale | | | |
| 38516 | USGS_FOQUS_ID | | | | 1860 ft | | | 1895 ft | | | USGS FOCUS | sandstone shale | | | |
| 38517 | USGS_FOQUS_ID | | | | 1895 ft | | | 1912 ft | | | USGS FOCUS | shale | | | |
| 38518 | USGS_FOQUS_ID | | | | 1912 ft | | | 1932 ft | | | USGS FOCUS | sandstone | | | |
| 38519 | USGS_FOQUS_ID | | | | 1932 ft | | | 1950 ft | | | USGS FOCUS | shale | | | |

GVDC – How Does It Work?

- The GVDC is a data “broker,” not a data repository.



Project 2L03 – Extend the Data Model and Harden the GVDC

- Modify the GVDC system architecture and upgrade the system server to support a larger user-base.
 - GML compliant schema
 - Data translators and previewers
 - Interactive Map
 - Search results and data download code
 - Previewer for seismic velocity logs and suspension velocity logs
 - Hardware upgrade and redundancy
- Expansion of the Data Dictionary Standard to include data standards for
 - Seismic velocity (e.g. PS-Logger, Downhole Logging, crosshole velocity data, velocity profiles derived using surface wave profiling, SASW)
 - Laboratory geotechnical testing (e.g. triaxial, consolidation, etc.)
 - Insitu testing (e.g. pressuremeter)
- Development of an Operation and Maintenance Plan

2L03 Sponsors and Partners

Sponsored by:

- [CalTrans](#)
- [California Energy Commission](#)
- [Pacific Gas & Electric](#)
- [PEER-Lifelines Program](#)

In Partnership with:

- [Pacific Earthquake Engineering Research Center](#)
- [United States Geological Survey](#)
- [California Geological Survey](#)

Implemented by:

- [University of Southern California](#)
- [Consortium of Organizations for Strong-Motion Observations Systems](#)

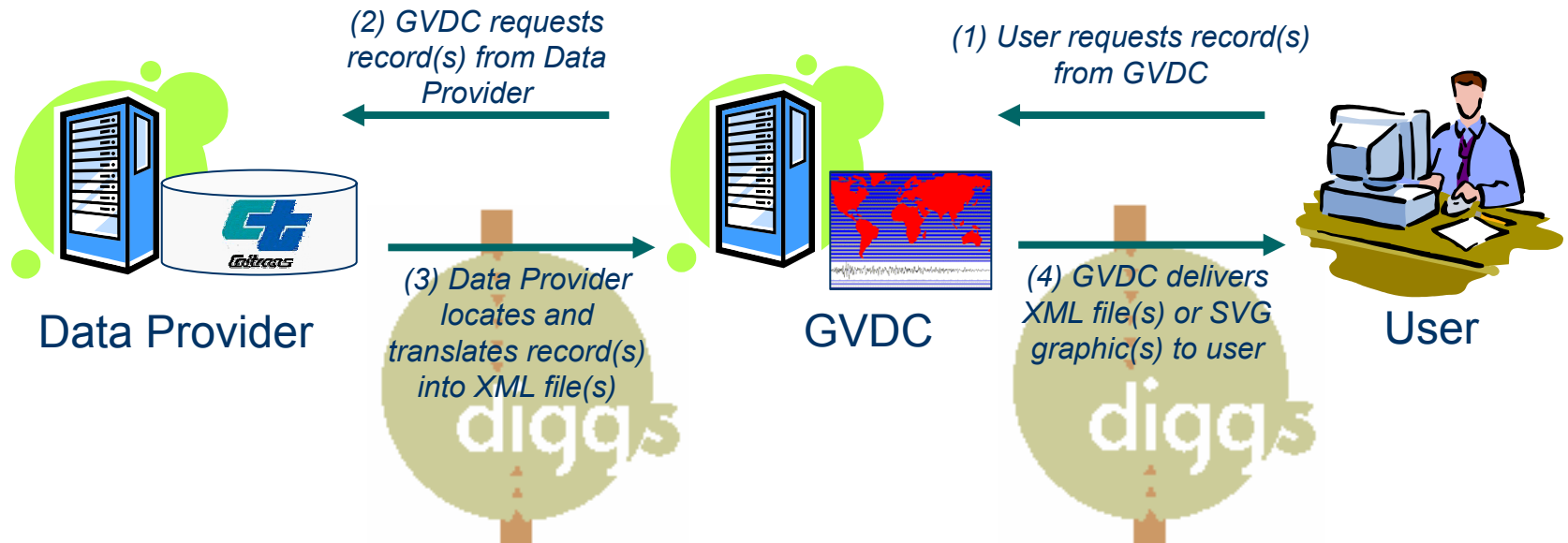


International Collaboration

- Collaborative effort with the *Federal Highway Administration (FHWA)* and the *Association of Geotechnical & Geoenvironmental Specialists (AGS)*:
 - Transportation Pooled Fund project recently launched by DOTs; led by Ohio DOT and FHWA.
 - CA, CT, Eastern Federal Lands Highway Division, GA, KY, MN, MO, NC, OH, TN
 - Funding: \$695k over 3 years.
 - Develop consensus data interchange format, “DIGGS,” based off of AGS and COSMOS-PEER-LL formats.
 - Potential for broad national and international adoption of standard.
 - Leveraging of research investments.
 - COSMOS/PEER-LL GVDC will implement the new standard.

GVDC – How Does It Work?

- DIGGS would be implemented into the GVDC for delivering records to the user.



The COSMOS/PEER-LL Geotechnical Virtual Data Center (GVDC)

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Jean Benoit, UNH

John Bobbit, POSC

Dan Ponti, USGS

Charles Real, CGS

Jennifer Swift, USC

Loren Turner, Caltrans

Workshop on the Implementation of COSMOS/PEER-LL GVDC

Memphis, Tennessee

October 5-6, 2005

Technical overview of the Geotechnical Virtual Data Center (GVDC) Requirements For Becoming a Data Provider

**Implementation of the
COSMOS/PEER-LL GVDC**

October 5, 2005

Jennifer Swift

Department of Civil and Environmental Engineering
University of Southern California

Sponsors and Partners

- This project is funded by:
 - Pacific Gas & Electric (PG&E)
 - Caltrans
 - California Energy Commission (CEC)
 - PEER-Lifelines
- In partnership with:
 - PEER
 - United States Geological Survey (USGS)
 - California Geological Society (CGS)
- Project Implementation:
 - COSMOS
 - University of Southern California

Agency, Academia and Industry Collaboration

- Jennifer Swift, USC
- Joe Futrelle, NSCA UIUC
- Dan Ponti, USGS
- J.P. Bardet, USC
- Debra Bartling, PEER / Berkeley
- Keith Farnsworth, Caltrans
- Bob Moscovitz, CGS
- Raghu Satyanarayana, UNH / ESC
- Mindy Squibb, COSMOS
- Joseph Sun, PG&E
- Scott Weaver, Earthsoft

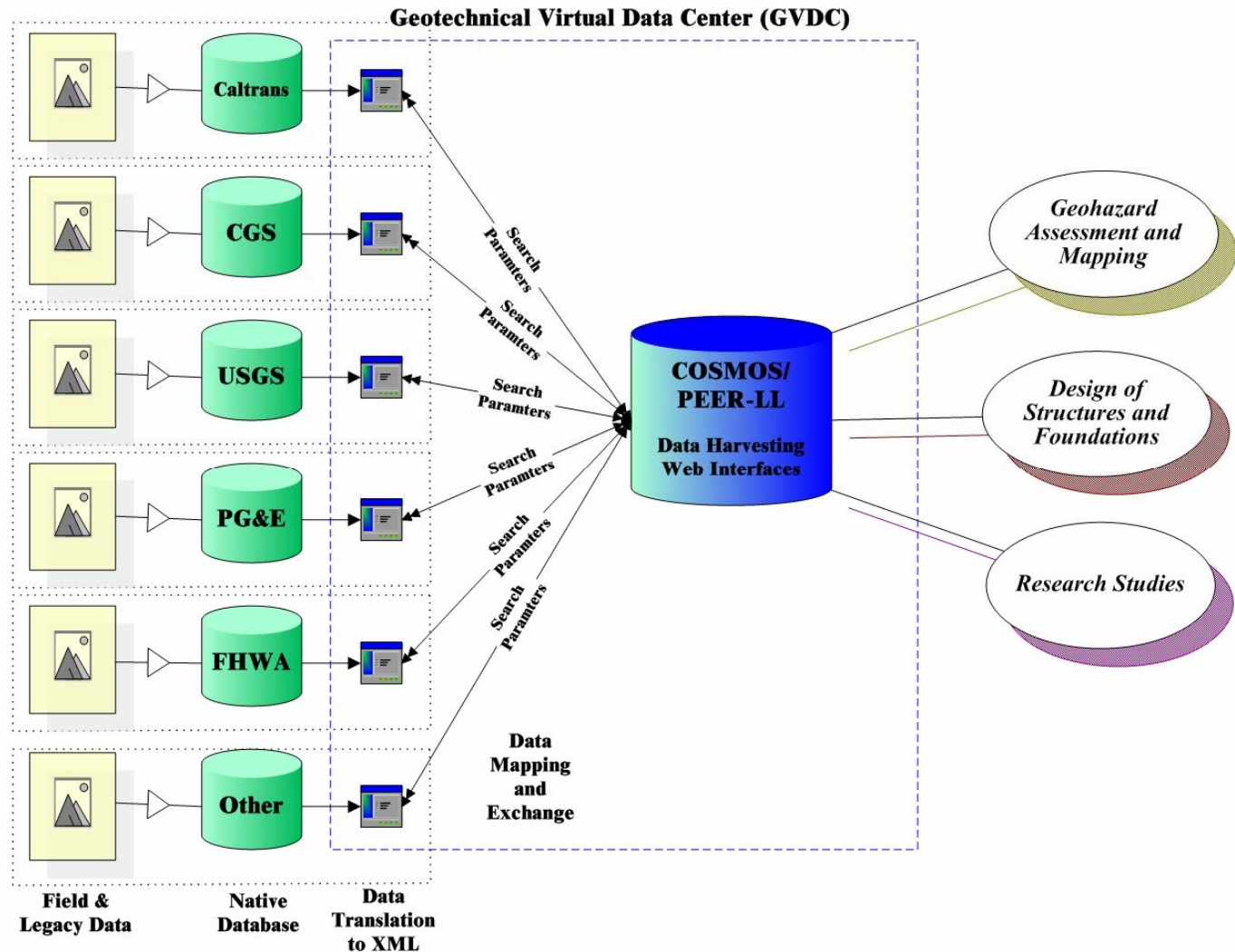
Front End Development:

- Paul Grimes, Caltrans
- Sean Devlin, USGS
- Jianping Hu, USC
- Alexei Peters, Farallon
- Joseph Castro, Internovations
- Michael Jarvis, Internovations
- Ivan Nincic, Savage Software

GVDC Technical Overview

- **System architecture supports web-based interfaces which provide access to publicly available geotechnical data sets:**
 - **California Department of Transportation (Caltrans)**
 - **Pacific Gas and Electric Company (PG&E)**
 - **California Geological Survey (CGS)**
 - **United States Geological Survey (USGS)**

General concept of web-based virtual data dissemination center:



GVDC Front-End User Website

Implementation of the
COSMOS/PEER-LL GVDC
10/05/05

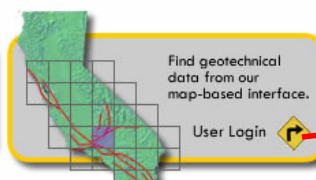
COSMOS/PEER-LL



HOME PROJECT INFO ABOUT CALENDAR USER SURVEY FORUM

Geotechnical Virtual Data Center (GVDC)

The overall project is divided into a short-term and a long-term objective. The project we are now undertaking encompasses the short-term objective only, to develop a pilot web-based system linking the PG&E, Caltrans, CGS and USGS example geotechnical data sets. The long-term objective (a future project not yet funded) is to extend the pilot system and develop a web-based system linking multiple data sets... [read more >>](#)



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- [PEER-Lifelines Program](#)

In Partnership with:

- [Pacific Earthquake Engineering Research Center](#)
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- [California Geological Survey](#)

Impl

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Login

Use this page to login so you can search for documents.

Subscriber Login

Existing COSMOS subscribers can use this form to login and search for documents.

Email Address:

Password:

Login

Login Help

Forgotten your password? Enter your email address below and click the *Email Password* button and we'll email it to you.

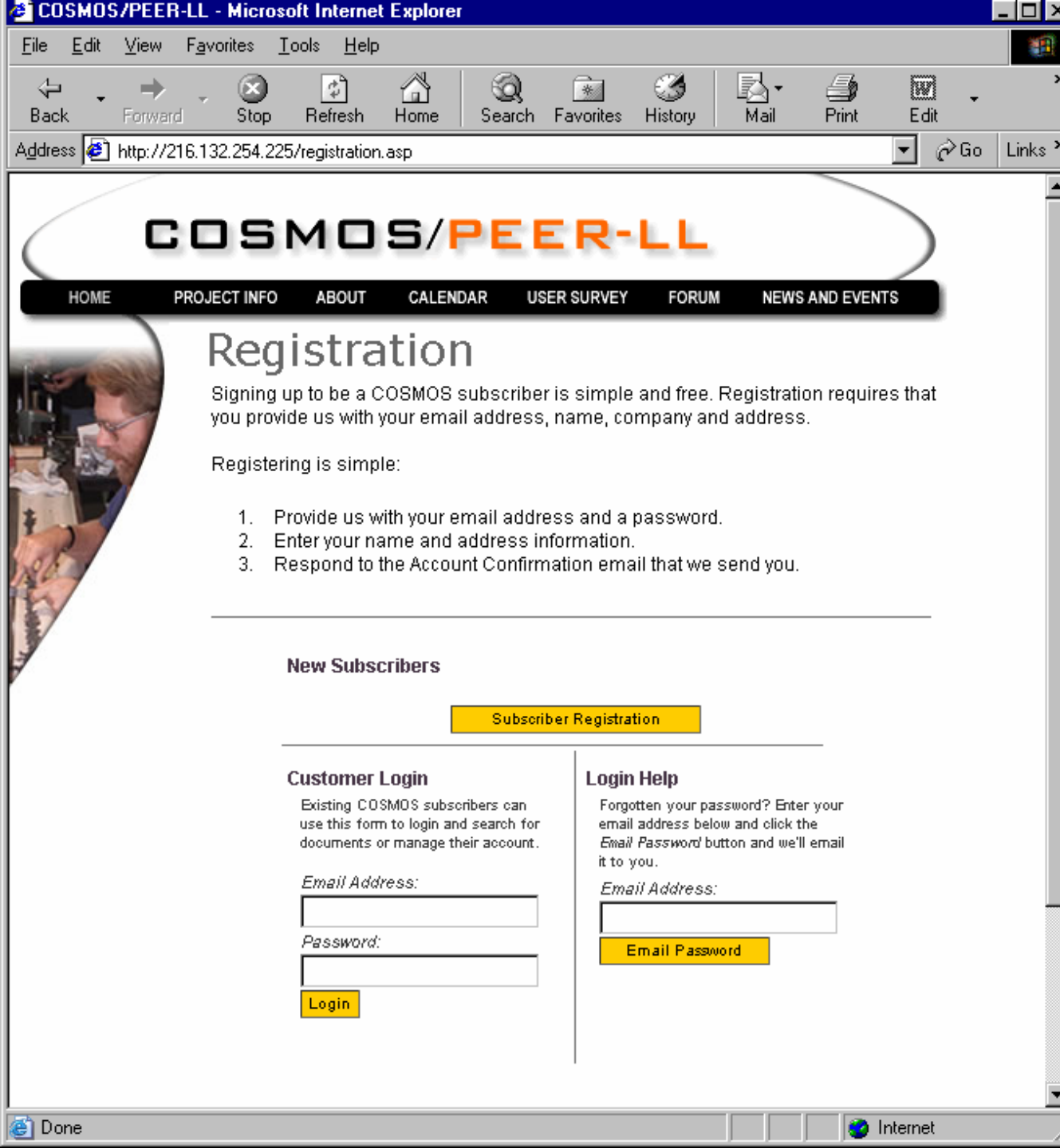
Email Address:

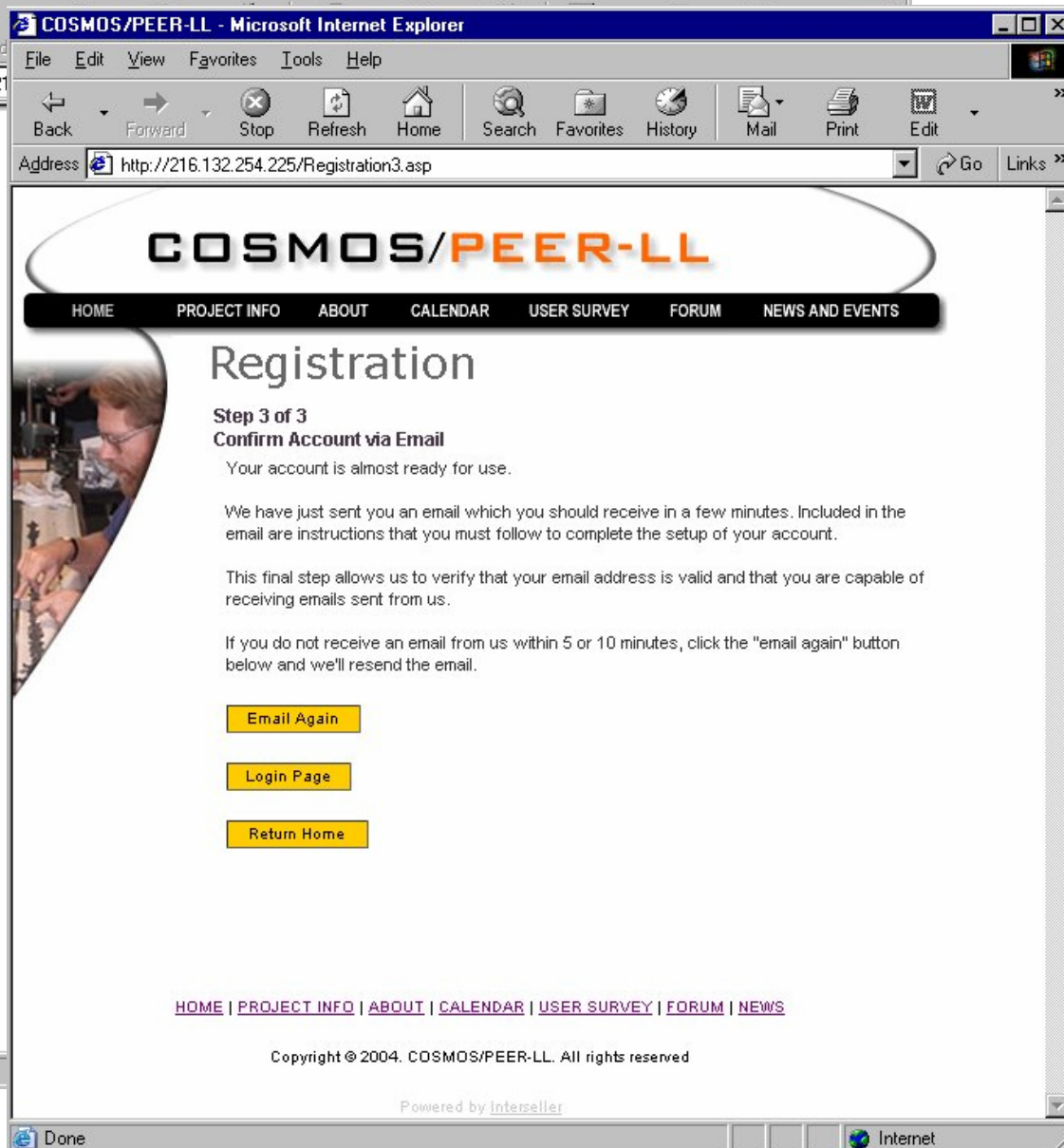
Email Password

Not a Subscriber Yet?

You can become a COSMOS subscriber by filling out our simple online registration form. Click the *Registration* button below to go to the registration form.

Registration





The screenshot shows the "Registration" page of the COSMOS/PEER-LL website. The page has a navigation bar with links: HOME, PROJECT INFO, ABOUT, CALENDAR, USER SURVEY, FORUM, and NEWS AND EVENTS. The main heading is "Registration". Below it, the sub-heading is "Step 3 of 3 Confirm Account via Email". The text states: "Your account is almost ready for use. We have just sent you an email which you should receive in a few minutes. Included in the email are instructions that you must follow to complete the setup of your account. This final step allows us to verify that your email address is valid and that you are capable of receiving emails sent from us. If you do not receive an email from us within 5 or 10 minutes, click the 'email again' button below and we'll resend the email." There are three yellow buttons: "Email Again", "Login Page", and "Return Home". At the bottom, there is a footer with links: HOME | PROJECT INFO | ABOUT | CALENDAR | USER SURVEY | FORUM | NEWS. Below that is the copyright notice: "Copyright © 2004. COSMOS/PEER-LL. All rights reserved." and the text "Powered by Interseller". The status bar at the bottom shows a "Done" icon and the text "Done".

COSMOS/PEER-LL

HOME PROJECT INFO ABOUT CALENDAR USER SURVEY FORUM NEWS AND EVENTS

Registration

Step 3 of 3
Confirm Account via Email

Your account is almost ready for use.

We have just sent you an email which you should receive in a few minutes. Included in the email are instructions that you must follow to complete the setup of your account.

This final step allows us to verify that your email address is valid and that you are capable of receiving emails sent from us.

If you do not receive an email from us within 5 or 10 minutes, click the "email again" button below and we'll resend the email.

Email Again

Login Page

Return Home

HOME | PROJECT INFO | ABOUT | CALENDAR | USER SURVEY | FORUM | NEWS

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COSMOS/PEER-LL - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss Real.com

Address <https://geodata.cosmos-data.org/CustomerHome.asp> Go Links »

COSMOS/PEER-LL

HOME PROJECT INFO ABOUT CALENDAR USER SURVEY FORUM NEWS AND EVENTS

Home Interactive Map Document Search Account Help Logout

Subscriber Home

Welcome to COSMOS Jennifer N. Swift of Dept. Civil Engineering, USC

Select an option from the button bar shown above or the menu below. When you're done using COSMOS, please click the logout button.

Subscriber Options

| | |
|---------------------------------|---|
| Interactive Map | Use this option to access the COSMOS Geotechnical data map. Your browser must allow Java execution for this map to function. |
| Document Search | This option allows you to search our extensive Geotechnical database of documents. |
| Account | Use this option to manage your account information including your name, company and address. |
| Help | This options provides you with answers to commonly asked questions concerning the information we provide and how to access and interpret information. |

Download History

| |
|---|
| 000002_00032_33117H8 : EXCEL : 7/8/2004 |
| 000002_00032_33117H8 : XML : 7/8/2004 |
| 000019_00083_33118G1 : EXCEL : 7/8/2004 |
| CDT50 : EXCEL : 7/8/2004 |
| CDT51 : XML : 7/8/2004 |
| CDT51 : EXCEL : 7/8/2004 |
| CDT61 : EXCEL : 7/5/2004 |
| CDT61 : XML : 7/5/2004 |
| CDT61 : EXCEL : 7/5/2004 |

Done Internet

https://geodata.cosmos-data.org/CustomerDataMap_v2.htm - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print View Source

Address https://geodata.cosmos-data.org/CustomerDataMap_v2.htm Go Links

COSMOS/PEER-LL

HOME PROJECT INFO ABOUT CALENDAR USER SURVEY FORUM NEWS AND EVENTS

Home Interactive Map Document Search Account Help Logout

IDENTIFY THE SEARCH AREA BY MAP

Use the ARROW tool (cursor) to click and drag a rectangular search area, or enter the boundaries of the search area in the form to the right. Use ZOOM and PAN tools for navigation.

Scale: 4,748,192 SEARCH

Longitude Boundaries (decimal degrees)

Latitude Boundaries (decimal degrees)

Visible Active

- ☒ Cities
- ☐ Urban Boundaries
- ☒ Counties
- ☐ Roads
- ☐ Streets
- ☐ Lakes
- ☐ Rivers
- ☐ Shaded Relief
- ☐ USGS Topo Quads

0 58.95mi
0 94.88km

Filter Search Results:

DATA TYPES

☒ Find all data sets
☐ Specify data sets to search

DATES OF INVESTIGATION

☒ Find all dates
☐ Specify a range of dates (MM/DD/YYYY)

FROM TO

TOTAL BOREHOLE DEPTH

☒ Find all borehole depths
☐ Specify a range of borehole depths

MIN MAX

GIS by Farallon Geographics

IDENTIFY THE SEARCH AREA BY MAP

Use the ARROW tool (cursor) to click and drag a rectangular search area, or enter the boundaries of the search area in the form to the right. Use ZOOM and PAN tools for navigation.

COSMOS - Data Types - Microsoft Internet Explorer

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Check the data types you wish to filter by:

- ☐ AGE - Age
- ☐ AQI - Aquifer
- ☐ ATL - Atterberg Limits
- ☒ BLG - Basic
- ☐ BHE - Borehole Electric Logs
- ☐ BHG - Borehole Gamma
- ☐ BHI - Borehole Imaging
- ☐ BPW - Borehole P-Wave
- ☐ BSW - Borehole S-Wave
- ☒ CPT - Cone Penetration Testing
- ☐ CON - Consolidation
- ☐ CAD - Correlation Age Dating
- ☐ DGC - Detailed
- ☐ FLL - Fluid Level
- ☐ FRS - Formations
- ☐ MIN - Mineralogy/Petrology
- ☐ MSC - Moisture Content
- ☐ NAD - Numerical Age Dating
- ☐ OCT - Other Chemical Test
- ☐ OET - Other Engineering Test
- ☐ OIE - Other In-Situ Engineering Test
- ☐ OIG - Other In-Situ Geophysical Test
- ☐ OIH - Other In-Situ Hydrologic Test
- ☐ OST - Other Stratigraphic Test
- ☐ PLM - Paleomagnetism
- ☐ PLT - Paleontology
- ☐ PSA - Particle-Size Analysis
- ☐ PHC - pH
- ☐ PPD - Pore Pressure Dissipation
- ☐ PVC - Pore Water Chemistry
- ☐ PMT - Pressuremeter Testing
- ☐ ROP - Reduction-Oxidation Potential

Filter Search

DATA TYPE

☒ Find all data sets

☐ Specify data sets to search

FROM

Scale: 4,748,192

SEARCH

Longitude Boundaries
(decimal degrees)

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Document Search Results

This page displays the results of your search of our geotechnical documentation database.

California Department of Transportation

| VDC Record ID | Project | Hole | Data Type | Project Date | Updated | Contact | Downloads |
|--------------------|-----------------|--------|-----------|--------------|----------|----------|---|
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

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| VDC Record ID | Project | Hole | Data Type | Project Date | Updated | Contact | Downloads |
|--------------------|-----------------|--------|-----------|--------------|----------|----------|---|
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

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|-------------------------------|-------------------------|----------------------|---------------------------|------------------------------|-------------------------|-------------------------|---|
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

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| VDC Record ID | Project | Hole | Data Type | Project Date | Updated | Contact | Downloads |
|-------------------------------|-------------------------|----------------------|---------------------------|------------------------------|-------------------------|-------------------------|---|
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 2321-03928221-0948 | Mace Rahon O.C. | 97-092 | CPT | 12-08-1998 | 2-5-2000 | M. Tyler | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

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Your search returned data sets from the following data providers:
California Geological Survey (1271)
Total data sets returned: 1271


| VDC Record ID (1) | Project (2) | Hole (3) | Data Type (4) | Project Date (5) |
|----------------------|--|--------------------------|------------------|-----------------------|
| 000002_00039_33117H8 | ORANGE FWY 57 AND TONNER CANYON BRIDGE | CGS_000002_00039_33117H8 | FLL | 1989-08-1 |
| 000002_00039_33117H8 | ORANGE FWY 57 AND TONNER CANYON BRIDGE | CGS_000002_00039_33117H8 | SPT | 1989-08-1 |
| 000002_00039_33117H8 | ORANGE FWY 57 AND TONNER CANYON BRIDGE | CGS_000002_00039_33117H8 | BLG | 1989-08-1 |
| 000002_00039_33117H8 | ORANGE FWY 57 AND TONNER CANYON BRIDGE | CGS_000002_00039_33117H8 | DGC | 1989-08-1 |
| 000002_00041_33117H8 | ORANGE FWY 57 and TONNER CANYON BRIDGE | CGS_000002_00041_33117H8 | FLL | 1989-08-1 |
| 000002_00041_33117H8 | ORANGE FWY 57 and TONNER CANYON BRIDGE | CGS_000002_00041_33117H8 | SPT | 1989-08-1 |
| 000002_00041_33117H8 | ORANGE FWY 57 and TONNER CANYON BRIDGE | CGS_000002_00041_33117H8 | BLG | 1989-08-1 |
| 000002_00041_33117H8 | ORANGE FWY 57 and TONNER CANYON BRIDGE | CGS_000002_00041_33117H8 | DGC | 1989-08-1 |
| 000002_00042_33117H8 | ORANGE FWY 57 and TONNER CANYON BRIDGE | CGS_000002_00042_33117H8 | DGC | 1989-08-1 |
| 000002_00042_33117H8 | ORANGE FWY 57 and TONNER CANYON BRIDGE | CGS_000002_00042_33117H8 | FLL | 1989-08-10 2002-03-14 |

Excel XML

WebForm1 - Microsoft Internet Explorer

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Site Name: ORANGE FWY 57 and TONNER CANYON BRIDGE
Hole ID: CGS_000002_00041_33117H8
Data Provider: CGS
Data Source: CA Dept of Transportation
Longitude: -117.8765
Latitude: 33.9386

Hole Type: test/exploratory boring
Hole Depth: 60
Hole Elevation: 453.5
Driller: CDT
Log Date: 8/10/89
Last Updated: 3/14/02

| Depth | Sample | SPT Blows | Lithology | Description / Comments |
|-------|--------|-----------|-----------|--|
| 0 | | | | SM: SLIGHTLY COMPACT TO COMPACT BROWN POORLY SORTED SILTY SAND WITH SOME CLAY BINDER AND THIN INTERBEDS OF CLAYEY SILT |
| -5 | | 11 | | |
| -10 | | 19 | | |
| -15 | | 17 | | |
| -20 | | 43 | | SW: DENSE BROWN GRAVELLY POORLY SORTED SAND |
| -25 | | 26 | | SP: COMPACT BLUISH GRAY MEDIUM TO COARSE SAND WITH THIN INTERBEDS OF FINE SAND WITH SOME SILT |
| -30 | | 47 | | SW: DENSE BLUISH GRAY POORLY SORTED SAND WITH CLAY BINDING THIN INTERBEDS OF SHALE AND CEMENTED SHALE |
| -35 | | 67 | | ML: DENSE TO VERY DENSE OLIVE BROWN DESICCATED CLAYEY ORGANIC SILT (HIGH IN HYDROCARBONS) |
| -40 | | 33 | | |
| -45 | | | | |
| -50 | | 70 | | |
| -55 | | | | |
| -60 | | | | |

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| VDC Record ID | Project | Hole Name | Data Type | Project Date | Last Updated | Contact | Downloads |
|----------------------|------------------------------|--------------------------|-----------|--------------|--------------|-------------------------------|--|
| 000002_00108_33117H8 | Service Station | CGS_000002_00108_33117H8 | FLL | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00110_33117H8 | Former Shell Service Station | CGS_000002_00110_33117H8 | SPT | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00110_33117H8 | Former Shell Service Station | CGS_000002_00110_33117H8 | BLG | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00110_33117H8 | Former Shell Service Station | CGS_000002_00110_33117H8 | FLL | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00110_33117H8 | Former Shell Service Station | CGS_000002_00110_33117H8 | DGC | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00111_33117H8 | Chevron Station 9-0786 | CGS_000002_00111_33117H8 | BLG | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00111_33117H8 | Chevron Station 9-0786 | CGS_000002_00111_33117H8 | DGC | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00111_33117H8 | Chevron Station 9-0786 | CGS_000002_00111_33117H8 | FLL | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00111_33117H8 | Chevron Station 9-0786 | CGS_000002_00111_33117H8 | SPT | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00114_33117H8 | Chevron S.S. No.9-9686 | CGS_000002_00114_33117H8 | SPT | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00114_33117H8 | Chevron S.S. No.9-9686 | CGS_000002_00114_33117H8 | BLG | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00114_33117H8 | Chevron S.S. No.9-9686 | CGS_000002_00114_33117H8 | DGC | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input checked="" type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00114_33117H8 | Chevron S.S. No.9-9686 | CGS_000002_00114_33117H8 | FLL | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input checked="" type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00127_33117H8 | McLachlan Investment Company | CGS_000002_00127_33117H8 | FLL | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input checked="" type="checkbox"/> XML |
| 000002_00127_33117H8 | McLachlan Investment Company | CGS_000002_00127_33117H8 | SPT | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00127_33117H8 | McLachlan Investment Company | CGS_000002_00127_33117H8 | BLG | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input checked="" type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00127_33117H8 | McLachlan Investment Company | CGS_000002_00127_33117H8 | DGC | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input checked="" type="checkbox"/> XML |
| 000002_00151_33117H8 | Mobil Station No.18-793 | CGS_000002_00151_33117H8 | BLG | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input checked="" type="checkbox"/> XML |
| 000002_00151_33117H8 | Mobil Station No.18-793 | CGS_000002_00151_33117H8 | DGC | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |
| 000002_00151_33117H8 | Mobil Station No.18-793 | CGS_000002_00151_33117H8 | FLL | 1989-08-10 | 2002-03-14 | Teri Mc Guire | <input type="checkbox"/> Excel <input type="checkbox"/> XML |

Page: <1> - 2 - 3

(1) VDC Record ID - Unique ID used by the Virtual Data Center.
(2) Project - name from the data provider.
(3) Hole Name - name used by the data provider.
(4) Data Type - three letter data type code.
(5) Project Date - original date of data collection.
(6) Last Updated - date that data sets were digitized or modified.
(7) Contact - Contact for provide data.
(8) Downloads - check boxes to indicate the type of file you would like to download.

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| VDC Record ID | Format | Date |
|----------------------|---------------------|------------|
| 000002_00114_33117H8 | Excel v.4 or higher | 2002-03-14 |
| 000002_00114_33117H8 | Excel v.4 or higher | 2002-03-14 |
| 000002_00127_33117H8 | XML | 2002-03-14 |
| 000002_00127_33117H8 | Excel v.4 or higher | 2002-03-14 |
| 000002_00127_33117H8 | XML | 2002-03-14 |
| 000002_00151_33117H8 | XML | 2002-03-14 |

This data is being provided to you directly from the California Geologic Survey, Seismic Hazard Mapping Program, through the COSMOS GVDC.

801 K Street MS 12-31
Sacramento, CA 95814

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File type: WinZip File
From: geodata.cosmos-data.org

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Frequently Asked Questions and User Tips

1) How do I find or search for a particular site or borehole?

Ensure that the site locations are visible on the map by selecting the refresh tool button  on the toolbar above the map. Click on the Zoom tool button to zoom in on an area of interest, then click on the map or click and drag a rectangle to select an area to zoom in on. To see an explanation of the uses of the other tools in the toolbar, click on the help tool button . For instance, if you identify one or more boreholes (green points ) of interest, use the Pointer  to define an area surrounding those boreholes; the latitude and longitude of the bounding rectangle you draw by clicking and dragging around the boreholes are automatically loaded into the search fields at the right. Additional search criteria below the map are available for refining your search, such as depth of borehole, type of data available, and date of project. If your search is successful, one or more borehole results will be visible in a Results Page after you click the Search button on the left .

2) How do I use the layers to the right of the map?

-explanation of "Visible" and "Active", and how layers work with tools

3) How do I download data related to the borehole?

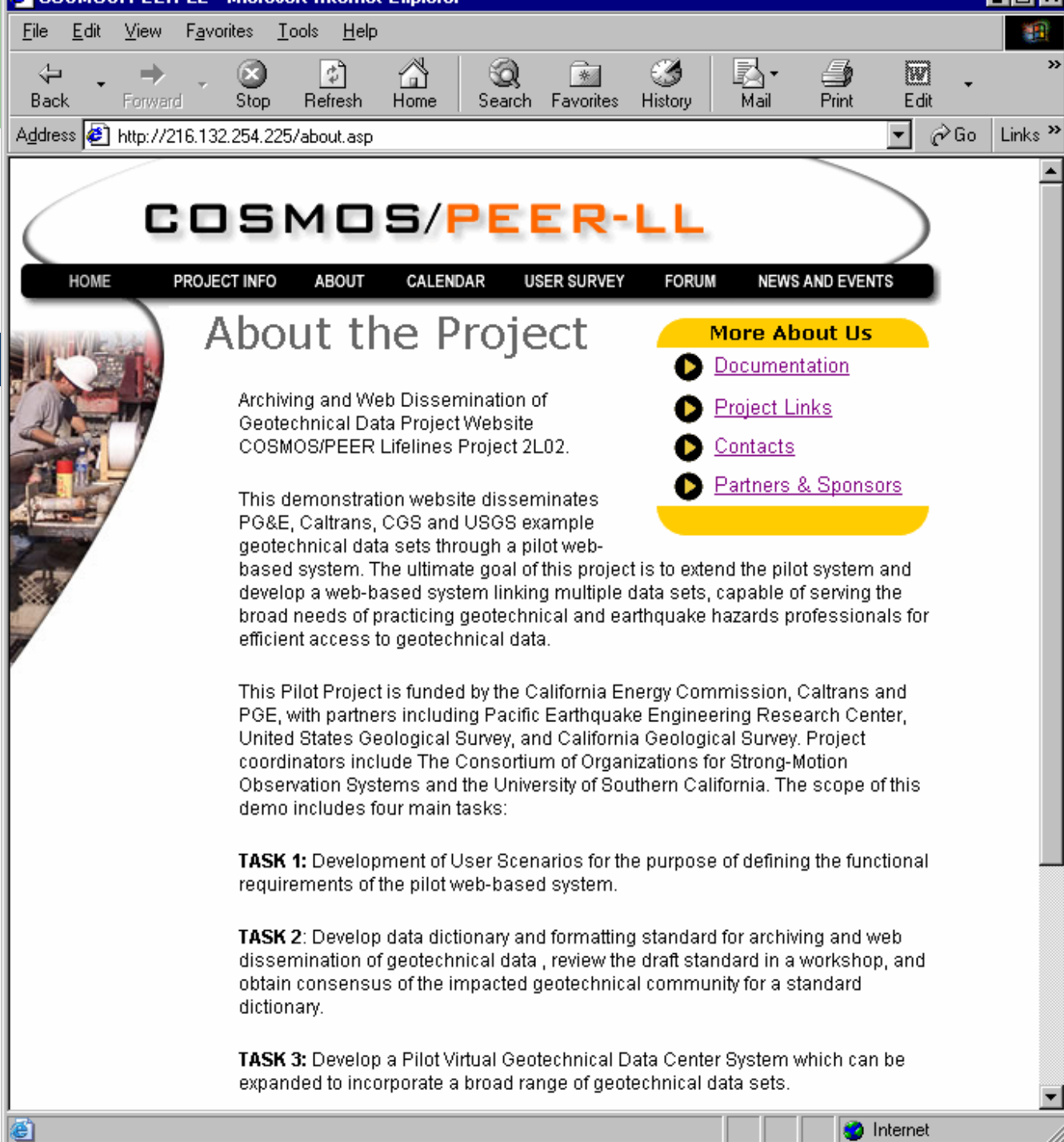
4) How do I view the data related to the borehole?

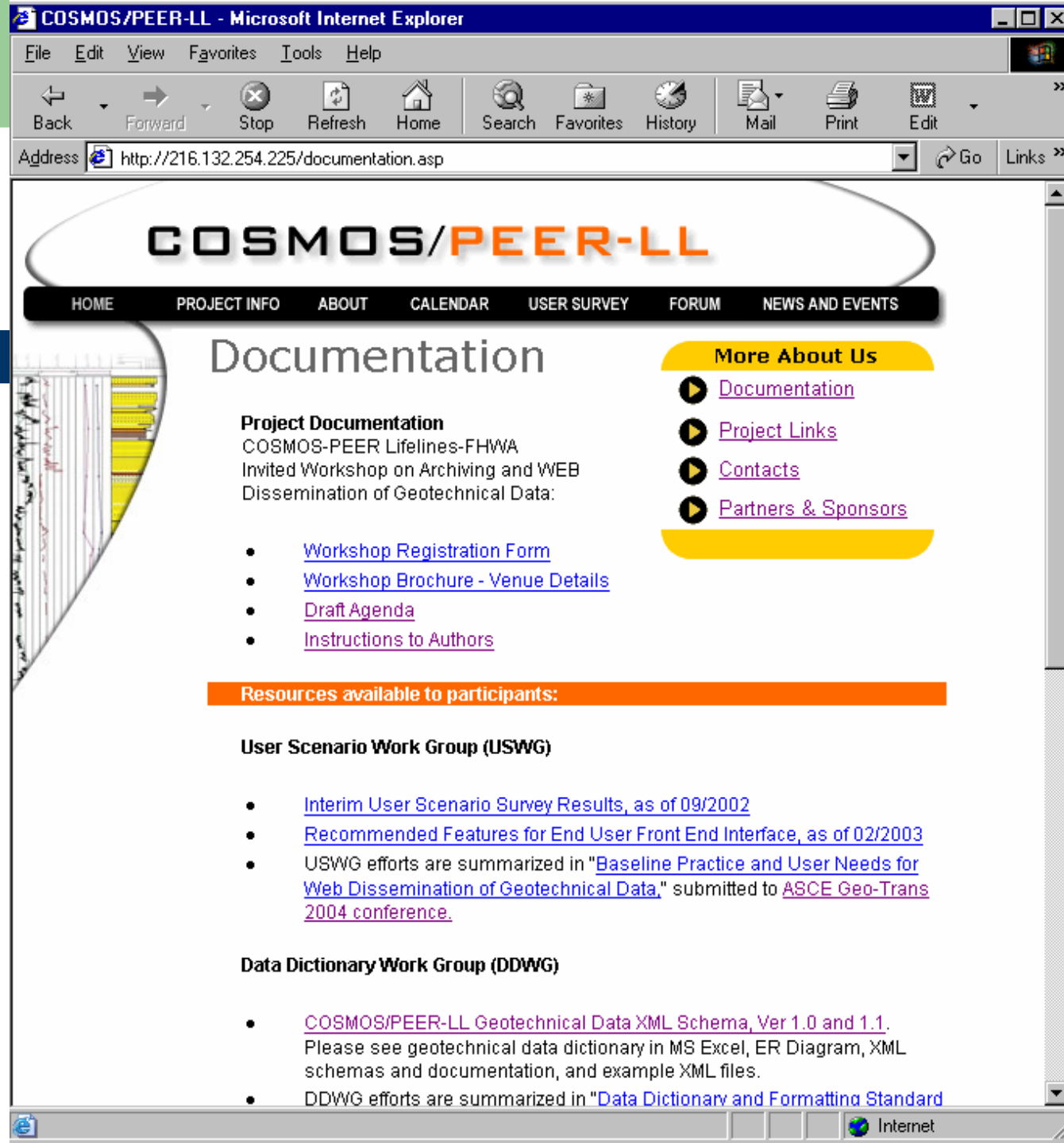
5) What kinds of data are available for a particular borehole?

For a given site, the following types of data may be available through the GVDC at this time:

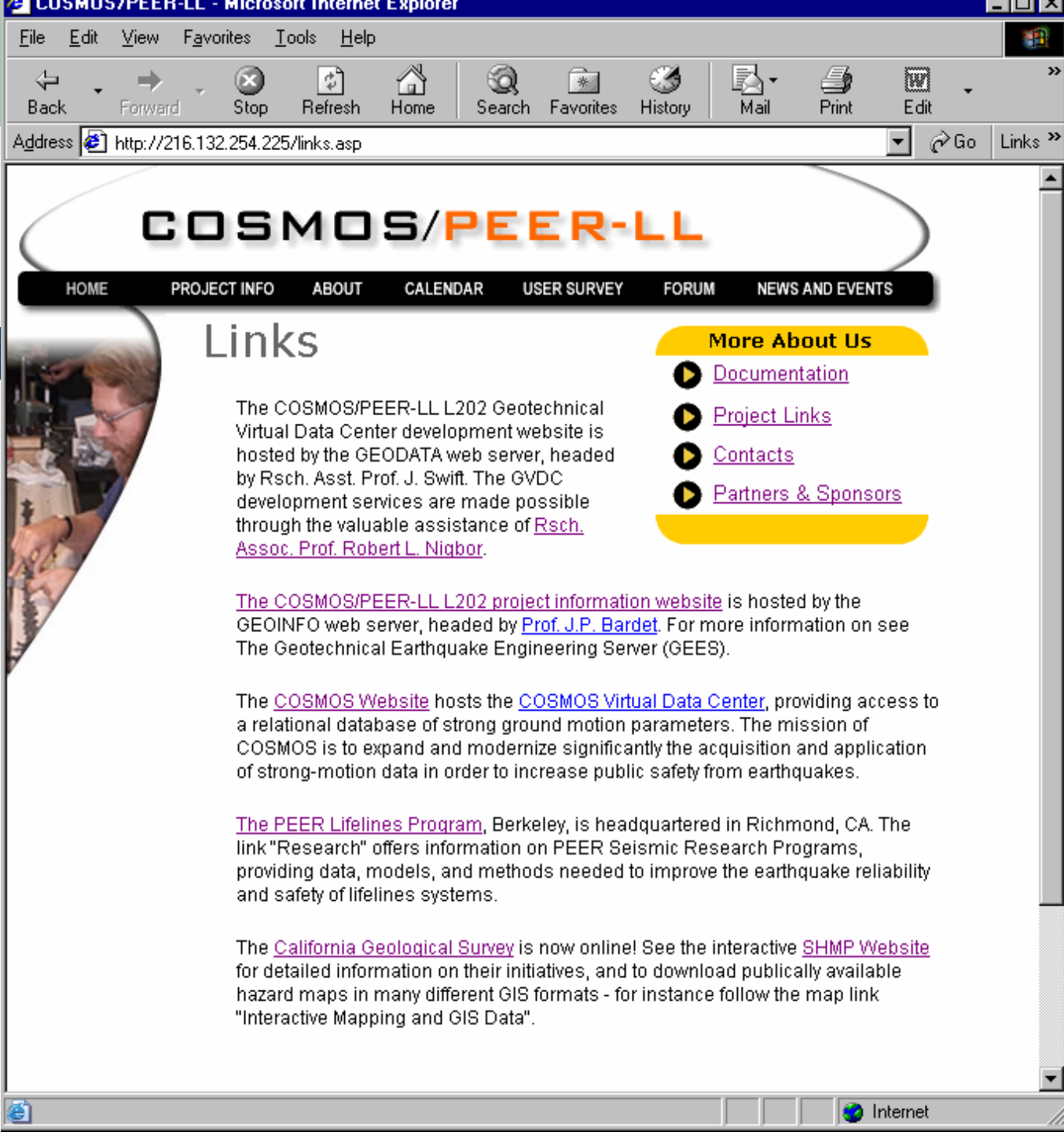
6) How do I obtain information about a feature on the map?

You can query any feature in any theme layer with the Identify tool. The ...Roads and Cities layers are taken from ESRI Data & Maps 1999 [...?], and displayed on this website through the courtesy of Geographic Data Technology, Inc., Lyme, New Hampshire.

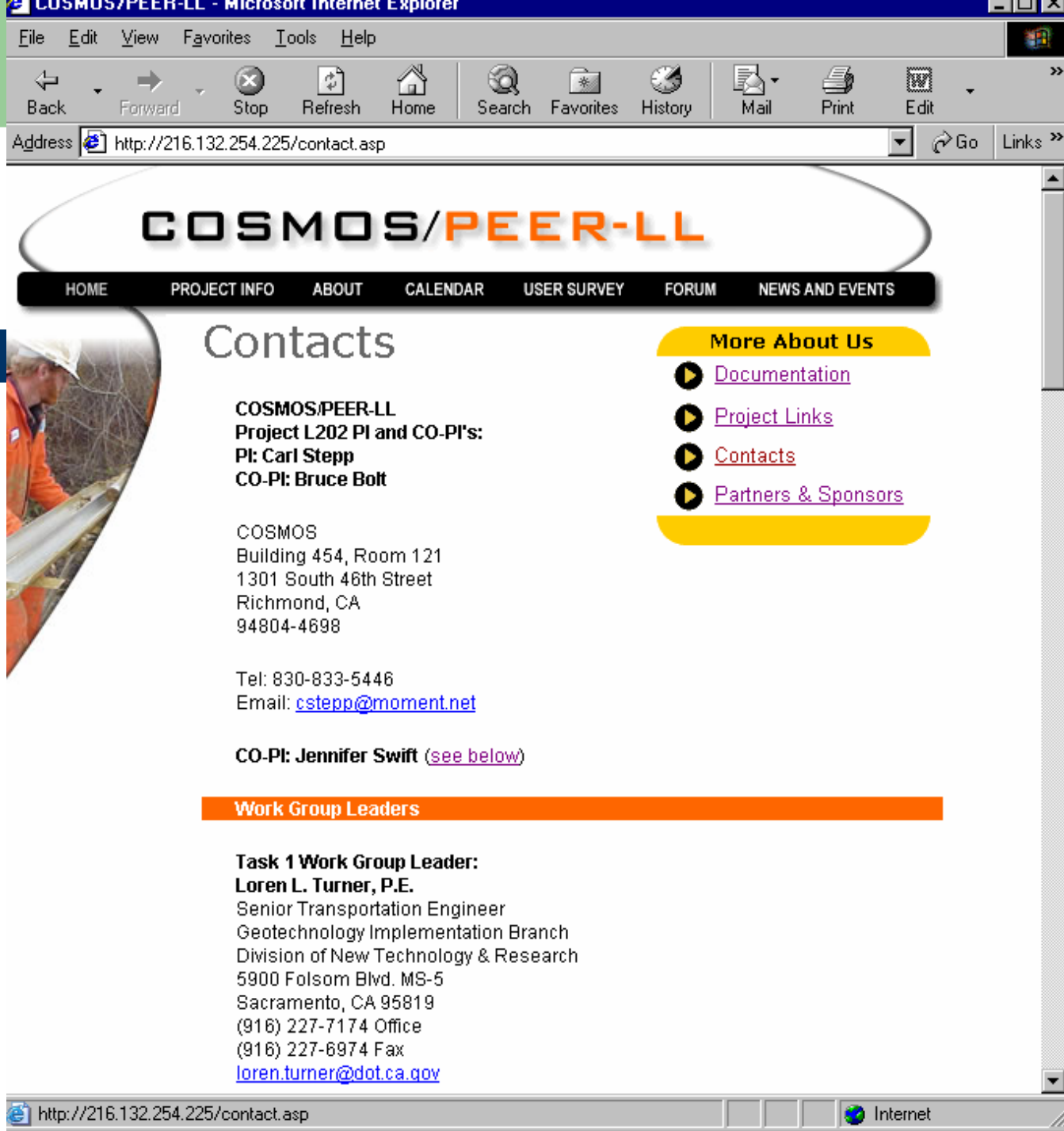


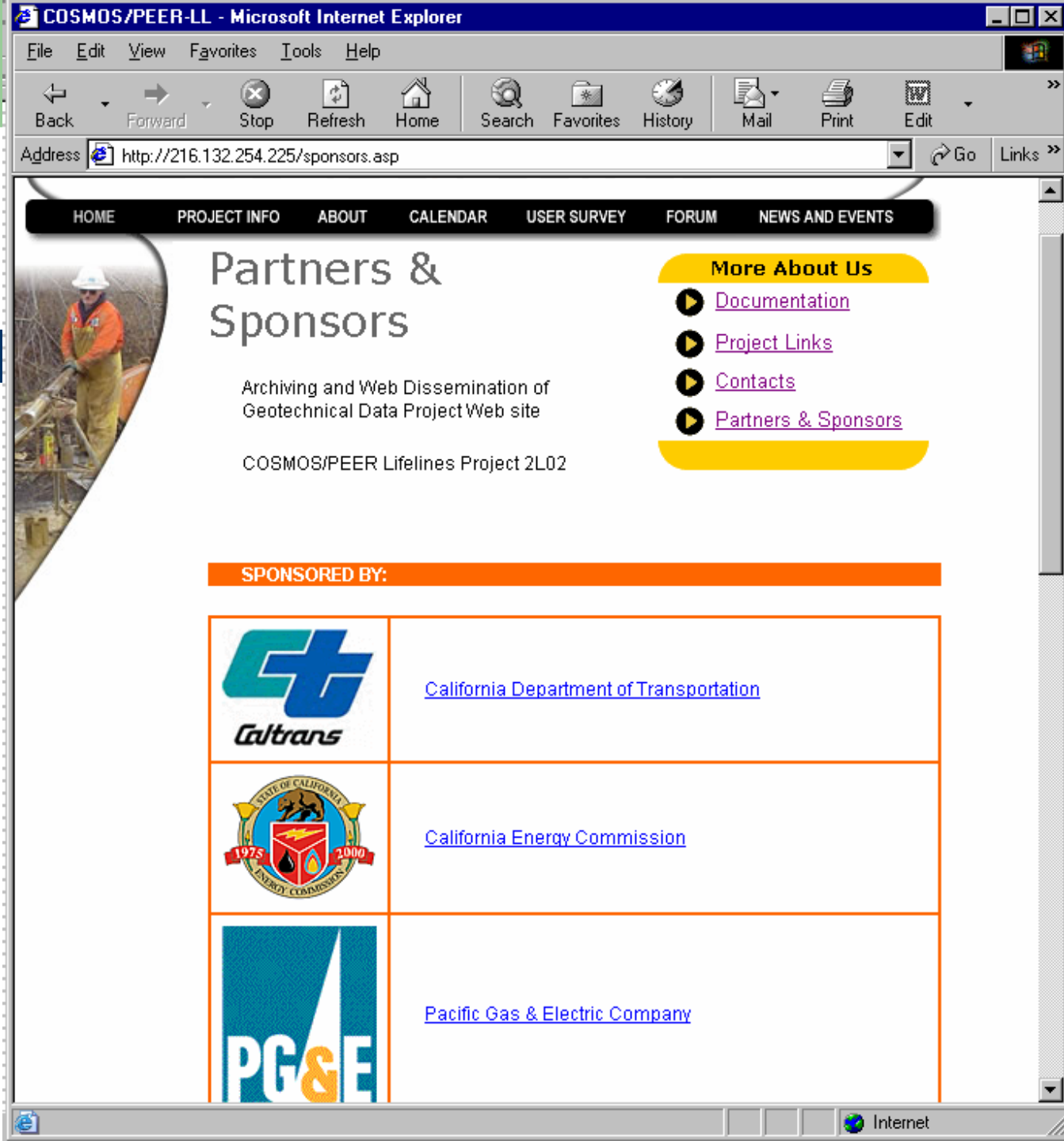


f the
GVDC

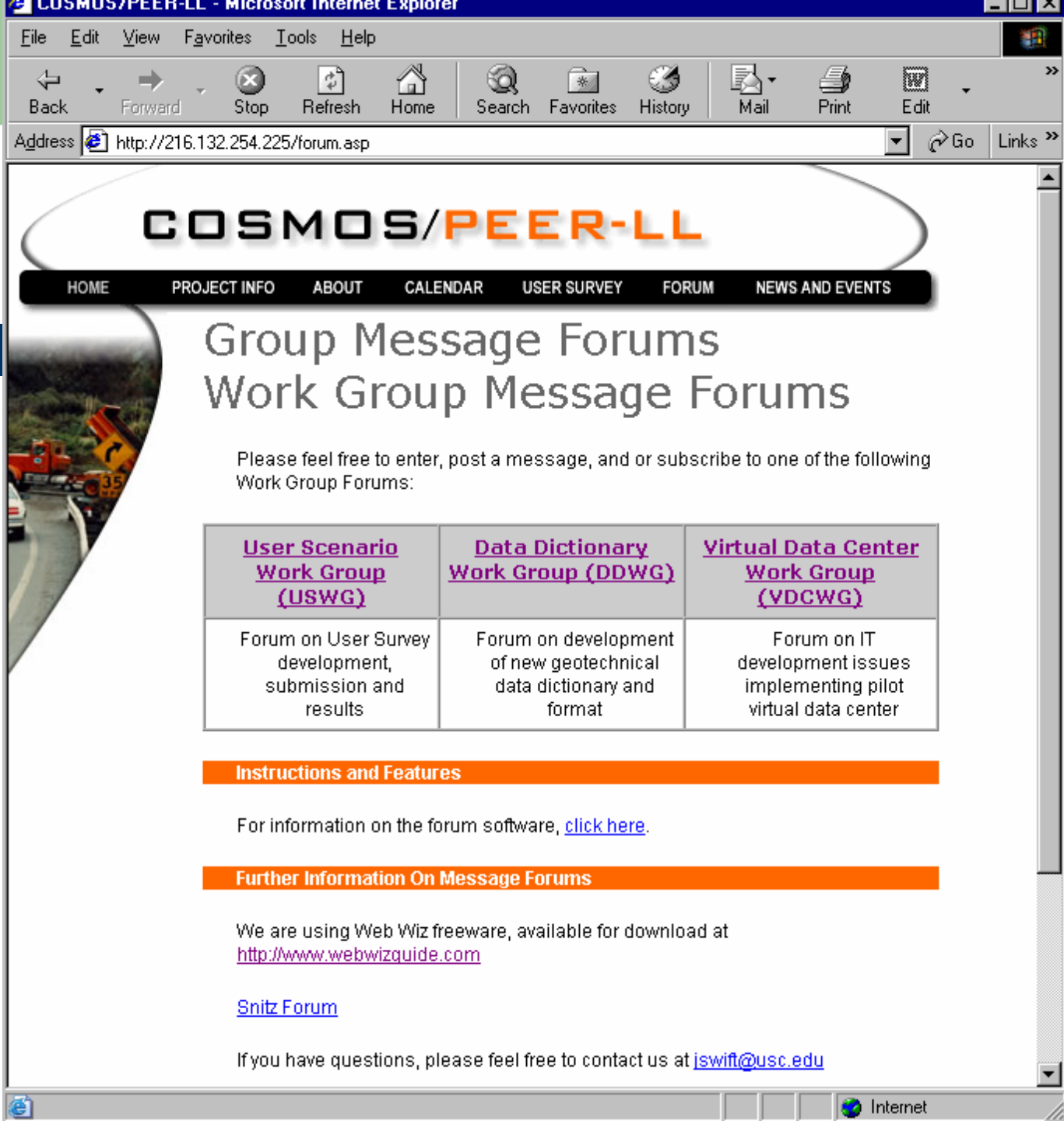


the
GVDC





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News and Events

News and Events

Archiving and Web Dissemination of Geotechnical Data Project Website

COSMOS/PEER Lifelines Project 2L02

Updated 05/27/2004 Draft Agenda

COSMOS-PEER Lifelines-FHWA

Invited Workshop on
Archiving and WEB Dissemination of
Geotechnical Data

Newport Beach Marriott Hotel **900 Newport Center Drive** **Newport Beach, CA** (click for driving instructions)

June 21 - 23, 2004

- [Workshop Registration Form](#)
- [Workshop Brochure - Venue Details](#)
- [Instructions to Authors](#)

June 21, 2004

PM

Other News

October 4&5 '01 COSMOS/PEER-LL Workshop on Archiving and Dissemination of Geotechnical Data

The objective is to develop consensus recommendations for classifying, archiving, and web dissemination of geotechnical data. Full pdf versions of papers, presentations and a detailed summary of the outcome will soon be available in a proceedings, as well as online. [More >>](#)

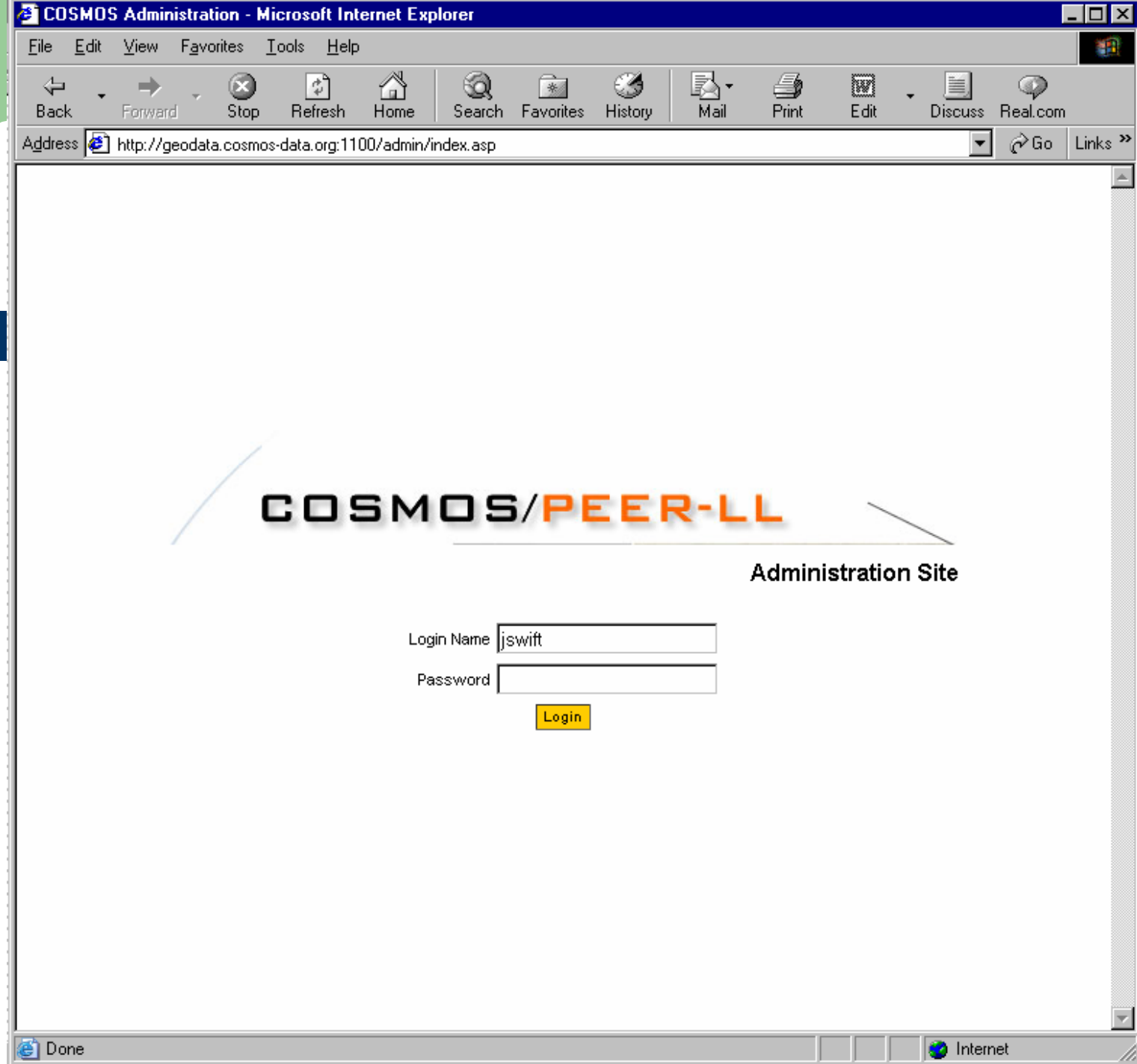
COSMOS Newsletter Article, No. 6, March 2002.

COSMOS and the PEER Lifelines Program are coordinating additional workshops and

the
GVDC

GVDC Administrative Website

Implementation of the
COSMOS/PEER-LL GVDC
10/05/05



COSMOS/PEER-LL

Administration Site

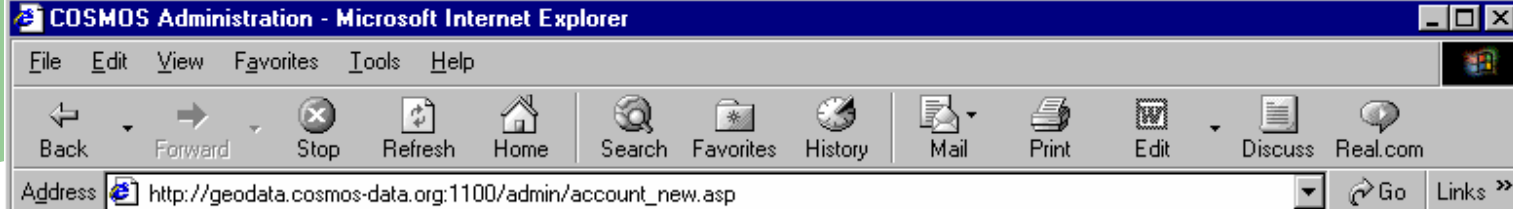
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Accounts

| |
|-----------------------|
| 101-202 303 |
| Caltrans-Loren Turner |

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Name:
first name last name

Title:

Email Address:

Password:

Telephone:
phone phone ext. fax

Address:

Address:
city state zip

Country:

Is New?:

Status:

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Name

first name

last name

Title

Email

Address

Telephone

phone

phone ext

fax

Address

Address

Address

city

state

zip

Country

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List
Enter/Edit

The list below shows the current sources for COSMOS data. Click *edit* to edit an existing provider or *new* to add a new provider.

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CA Dept of Transportation (CALTRANS)
CA Dept Water Resources (CALTRANS)
CA Geological Survey (CALTRANS)
CA Office of St. Architect (CALTRANS)
Caltrans (CALTRANS)
CDMG Hos Ste Review Proj (CGS)
City of La Habra (CGS)
City of San Clemente (CGS)
Fullerton Fire Department (CGS)
Goffman,McCormick (CGS)
LA Co. Dept. Pub Works (CGS)
Leighton (CGS)

new
edit

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Provider #
ID
Name
Core Provider
Is Active? ☒ Yes

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Disclaimers

Core Provider Disclaimers

The list below shows the 4 core providers for COSMOS data. Click *edit* to edit the disclaimer and contact information for a core provider.

Core Providers

California Department of Transportation

California Geological Survey

Pacific Gas and Electric

United States Geological Survey

edit

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COSMOS Administration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://geodata.cosmos-data.org:1100/admin/download_disclaimer_edit.asp Go Links »

COSMOS/PEER-LL

Administration Site

home user accounts downloads providers reports administrators legacy help **logout**

Edit Core Provider Disclaimers

< list save

Record ID 4
Name **California Geological Survey - CGS**

Address 1

Address 2

Logo URL

Main Phone

Website Name

Website URL

Download Note

Disclaimer

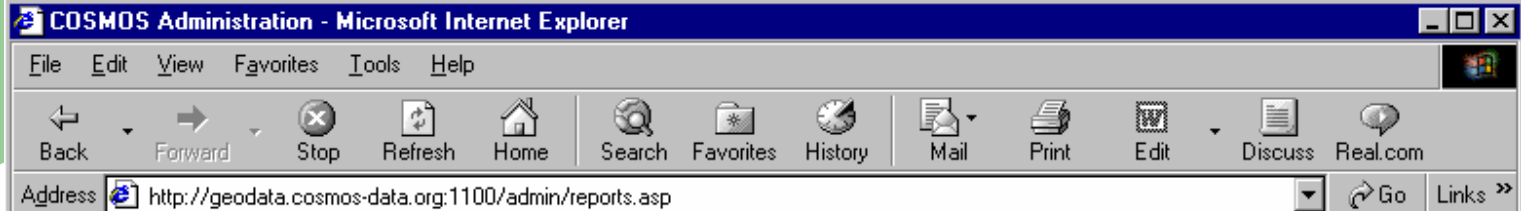
Please note that this Use Policy is subject to change without notice, and that it reflects California State's current business practices. This Use policy is dated December 7, 2000.

PERSONAL INFORMATION AND CHOICE

Contact 1

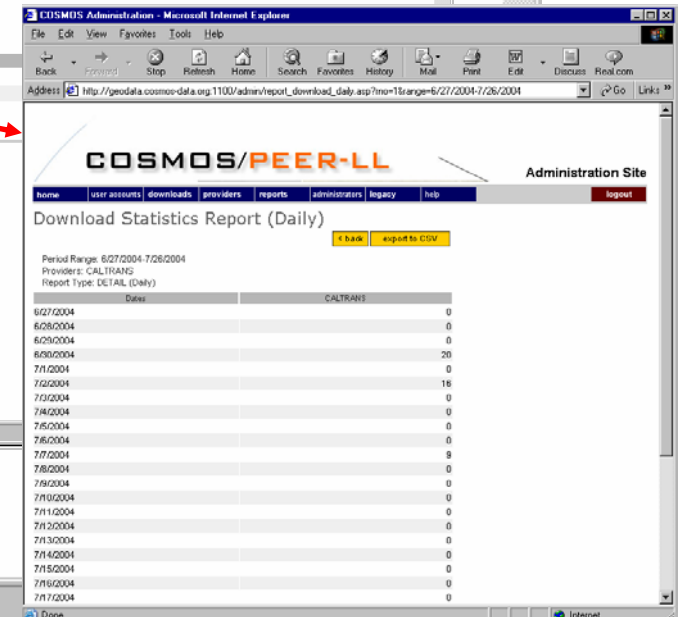
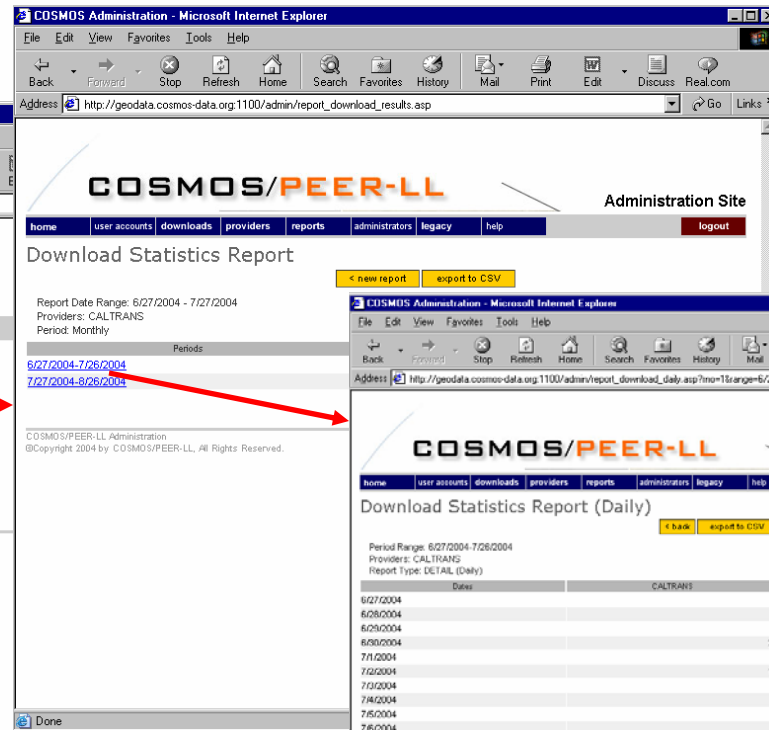
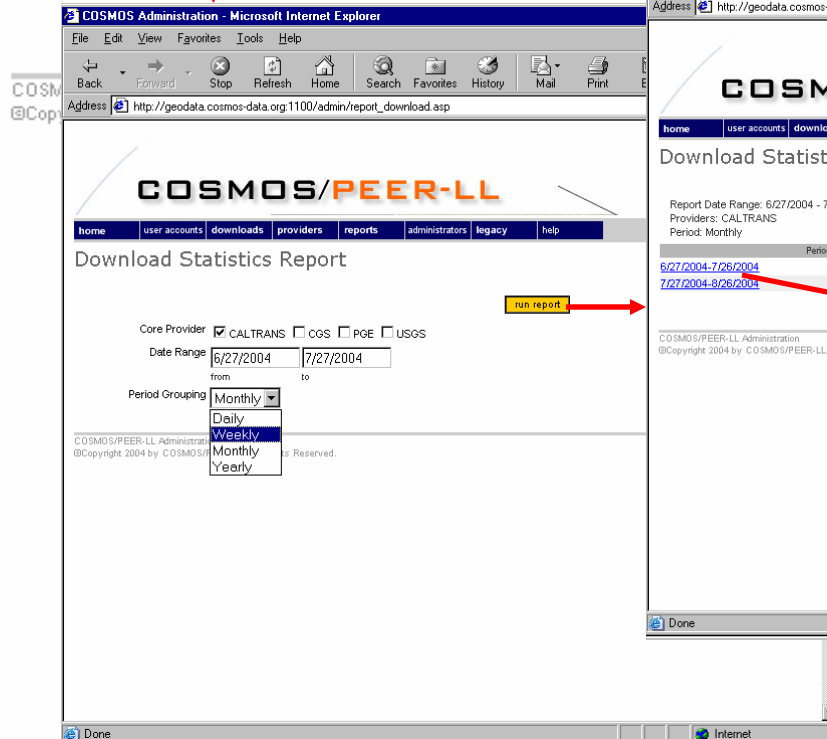
Done Internet

http://geodata.cosmos-data.org:1100/admin/download_disclaimers.asp Internet



Reports

1) [Download Statistics](#)



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Administration Site

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Administrative Users

The list below shows the current administrative users. Click *edit* to edit an existing user or *new* to add a new administrative user.

Current Admin Users

Carl Stepp
Cliff Roblee
COSMOS Admin User
Dan Ponti
Jennifer Swift
Joseph Castro
Loren Turner
Mindy Squibb
Paul Grimes
Teri McGuire

[new](#)[edit](#)

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List Admin Users
Enter/Edit Admin Users

COSMOS/PEER-LL

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Edit Administrative User

[< list](#) [delete](#) [new](#) [save](#)

User ID 13

Full Name Login Name Password Is Active? Is Super Admin? Associated Provider

Access Rights

user accounts

downloads

providers

administrators

reports

legacy

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Update Data Sets

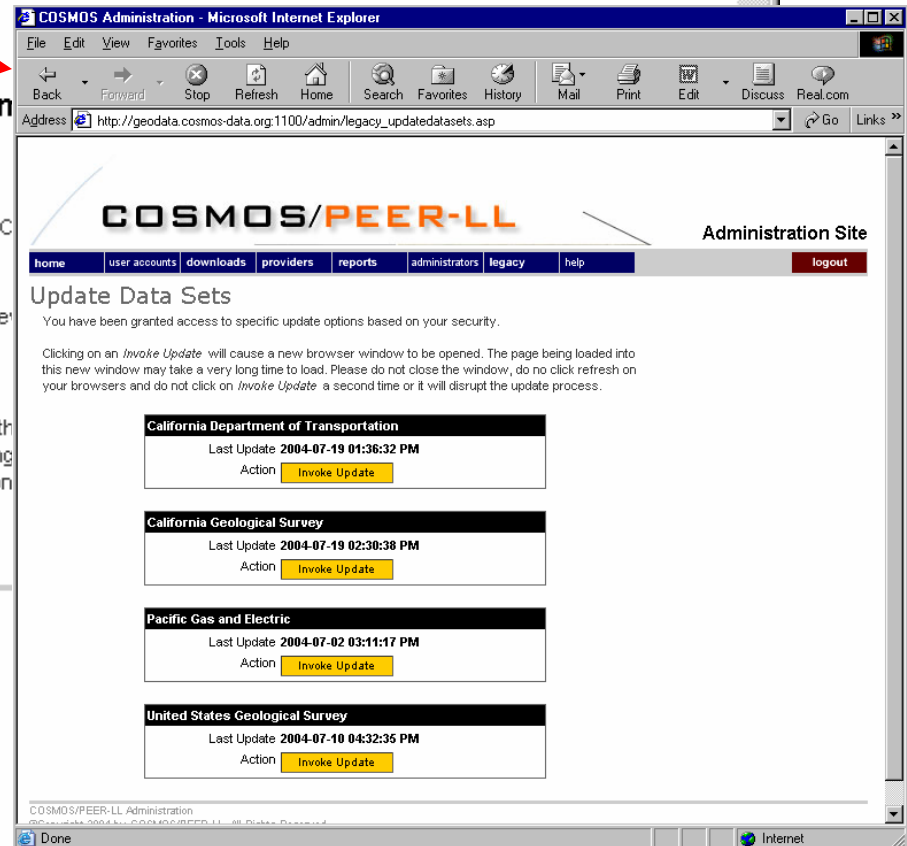
"Update" refers to the following actions:

- Adding new records to the GVDC
- Updating records already existing in the GVDC
- Deleting records from the GVDC
- Re-adding records to the GVDC that were previously deleted

Note:

When records are to be deleted by an Administrator, they are tagged as "deleted" during an Update. After performing an Update, records that were tagged as "deleted" are confirmed for deletion.

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COSMOS/PEER-LL

Administration Site

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Administrator FAQs

This portion of the site aims to answer frequently asked questions

If you don't know what you're doing, read the questions then, read the answers. Hopefully this process will result in you finding the answer to your question.

How do I add new records to my existing GVDC dataset?

Go to Main Menu item...

How do I delete data records from my existing GVDC dataset?

Go to Main Menu item...

Where is Paul?

Right here.

COSMOS/PEER-LL Administration

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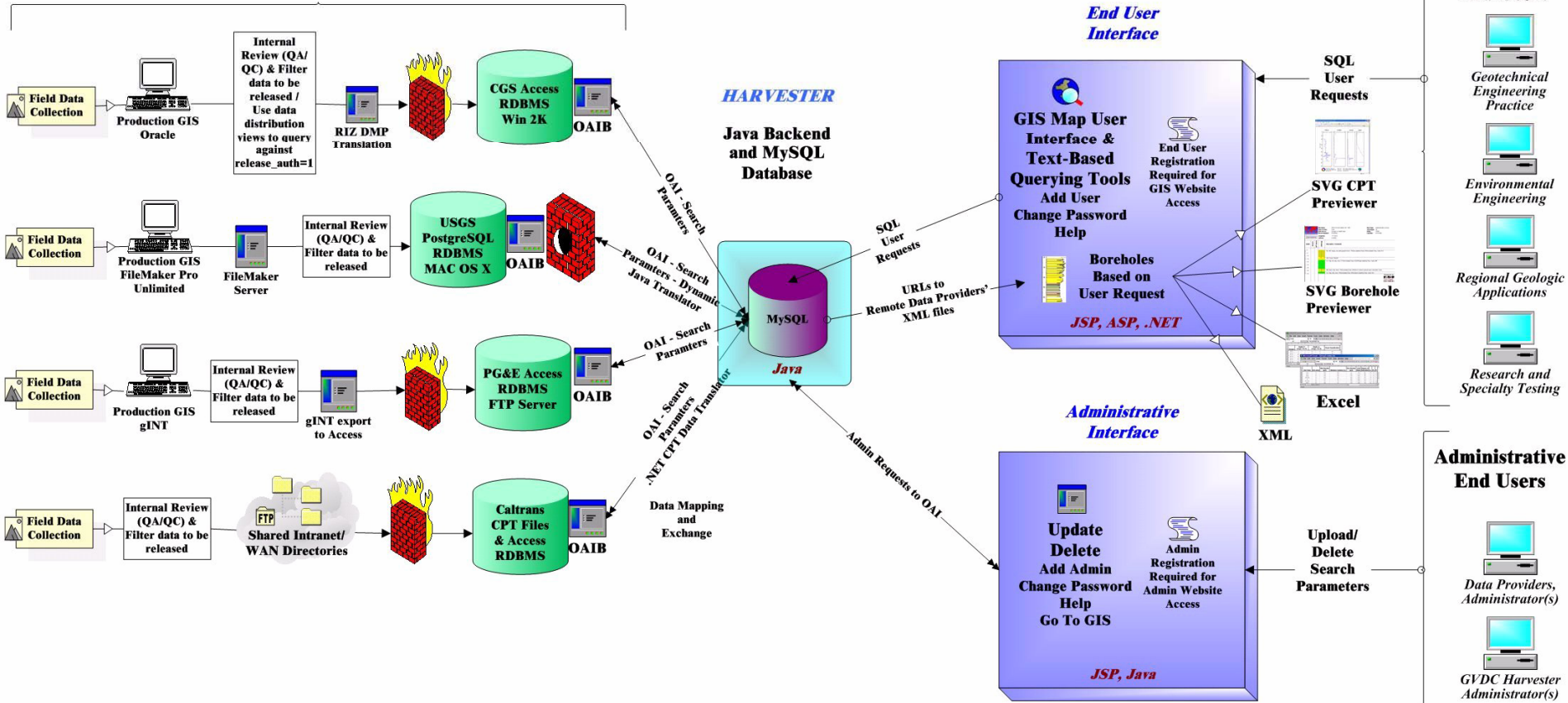
Development of System Architecture

- **System Integration (SI) survey of 4 data providers**
- **System Architecture**
 - Utilized OAIB (NCSA) exchange protocol for USGS, Caltrans, CGS and PG&E
 - Developed back-end MySQL database tailored to the Data Schema
 - Developed harvester code in Java using OAI
- **Development of Web Interfaces**
 - Integrated survey results into website design
 - GIS map interface tools: Farallon Geographics
 - Developed dynamic XML -> SVG data previewers
 - CPT: Caltrans
 - Borehole: Savage Software
 - User and administrator interfaces

Implementation of the
COSMOS/PEER-LL GVDC
10/05/05

Geotechnical Virtual Data Center (GVDC)

DATA Providers As of April 2004



Implementation of the
COSMOS/PEER-LL GVDC
10/05/05

To Become a GVDC Data Provider

- Tasks
 - Collect and maintain geotechnical and/or geophysical data, and required associated metadata
 - Write data translator – native format to XML
 - Install OAIB (open source program) to allow the GVDC to harvest the search parameter data from the native database
 - Develop Privacy and Data Use Policies

Tasks to Link to the GVDC

- Develop and Maintain a Geotechnical Data Inventory - **Any Database** can be used!
 - Prepare Legacy Metadata, so existing data can be harvested and searchable
 - Adopt new metadata standards, i.e.:
 - Add/Generate URL's to XML files
 - Dates, such as data archiving and update
 - Primary contact information

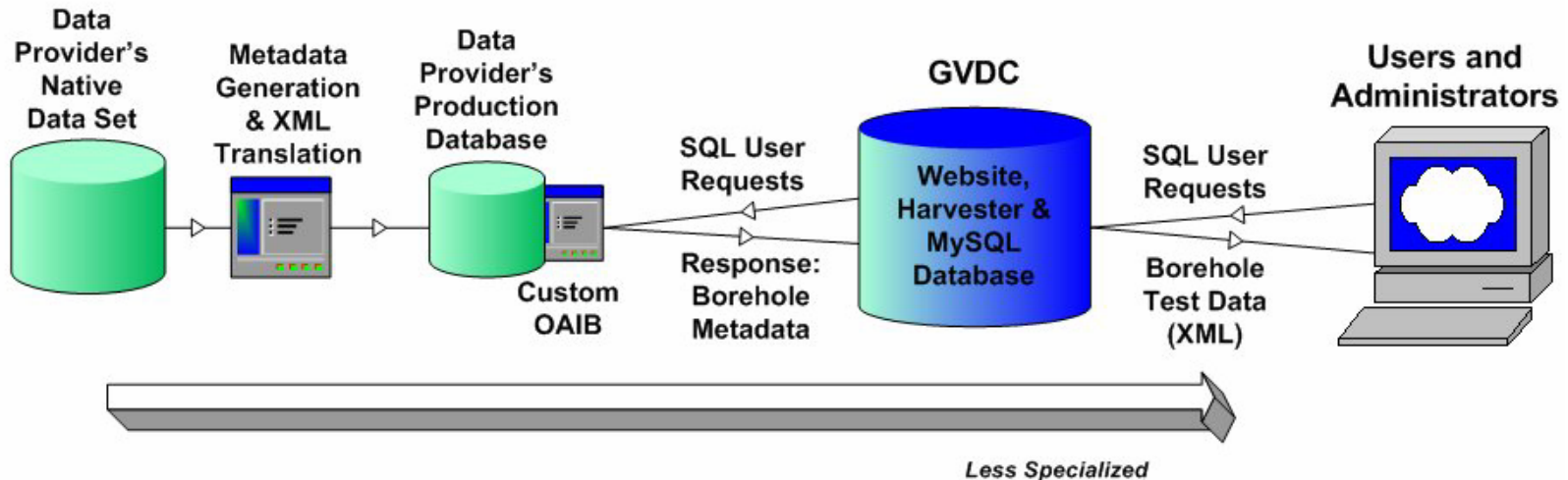
Current Borehole Metadata

| Field Name | Description |
|--|--|
| official_name | Data Provider's Unique internal ID for each borehole |
| longitude, latitude | The longitude and latitude of the borehole, given in the Geodetic Datum CRS. Changed from type Number for OAIB. |
| site_id | Unique ID for each site generated by translator, i.e. = CGS + - + official_name |
| site_name | Data Provider's internal site names. The name of the site of which this borehole is a part. A borehole must be related to a site. |
| data_source | Name of the original source (agency, institution, etc.) of borehole data. |
| start_date, end_date | Starting and ending dates of the collection activity for a given borehole. Format: Month/Day/Year. |
| date_last_updated | Date of data entry, or most recent update of existing record. Format: Month/Day/Year. |
| total_depth, depth_uom | The measured depth of the hole at its deepest point. The depth is measured from a depth datum, and is positive downward, as measured along the hole alignment. The value may also be qualified by who measured the depth {loggers, drillers}; The unit of measure of the measured depth. |
| xml_name | Path + filename of URL for static XML files containing geotechnical test data. |
| id | A code or simple name for this Business Associate (primary contact). This value is intended to be a foreign key for referencing this data instance. |
| name | A common name for this Business Associate. This name does not need to be unique within the naming system. |
| naming_system | A list of names or a method for developing a list of names. |
| type | The type of Business Associate. This should be one of the following: {company, person, consultant, work group, agency, other} |
| address, city, state., postal_code, voice_phone, email | The address and other contact information of the Business Associate. |
| associated_with | The company or group that this Business Associate is associated with. If the Business Associate is an employee, for example, the associate with would be the company which employs her. |
| ba_contact | A foreign key to another Business Associate who serves as a Business Associate for this Business Associate. |
| status | Status of a record; should be one of the following: {Active (or other similar word indicating that the record is available), or "Deleted"; latter indicates a record to be deleted from GVDC}. |

Tasks to Link to the GVDC (cont.)

- **Develop Data Translator, for converting data from existing format to DIGGS XML Format**
 - Any Language – Java, Visual Basic, etc...
 - i.e. MS Access Visual Basic Applications (VBA's), modules
- **The Translator could perform the following functions:**
 - Update native database tables to include information required by the GVDC
 - Convert geotechnical and geophysical data and associated metadata into XML files
 - Store XML file URLs in a table in database
 - Save XML files on a hard drive

Tasks to Link to the GVDC (cont.)



- Server OAIB software
 - Install “Open Archives-In-A-Box” Open Source software package, developed at NCSA
 - Setup configuration files which map the native data to the XML schema

Define Privacy & Data Use Policies

- ***Security/Privacy***

- Provider controls distribution of its borehole data
- GVDC collects/stores indexed provider metadata only
- Borehole and geophysical data served from provider-based server
- Provider has GVDC administrator privileges
- Provider logs user access

Policy (cont.)

- ***Provider Recognition***
 - Homepage logo/links
 - Query response grouped by provider – with recognition
 - Download opens provider window having recognition
 - Data files contain source/provider attributes

Future Tasks to Facilitate Data Provider's Role

- **Development of new implementation and data maintenance tools**
 - **Online Data Mapping**
 - **GVDC Connection, i.e.**
 - OAIB configuration file generator
 - **Universal Translator, i.e.**
 - MS Access
 - PostgreSQL
 - Static files, such as Hoggentogler

Feedback Welcome!

We'd appreciate your comments and suggestions:

- **Overall Website design**
 - End User Interfaces
 - Administrative Interfaces
- **Website functionalities**
 - Download geotechnical data
 - XML – add XSLT
 - MS Excel
 - Other?
 - Preview Data
 - Geophysical Logs
 - Other?

Data exchange format used by the GVDC

Workshop on the Implementation of COSMOS/PEER-LL GVDC

Memphis, Tennessee

October 5-6, 2005

Daniel J. Ponti, USGS

Data Interchange via COSMOS XML

- At present, pilot GVDC provides data from multiple data providers to the end user in a single data exchange format - COSMOS XML
- COSMOS XML is a structured text file containing an ordered set of elements tied to a data dictionary developed by COSMOS in the 2L02 project. It can be consumed by different kinds of applications for data display and further processing. Applications developed for the pilot include an Excel converter, borehole previewer and CPT previewer.
- COSMOS XML is a data interchange standard – NOT a database standard.

Goals and Philosophy of COSMOS Model

- Data exchange standard part of COSMOS' efforts to develop a proof-of-concept virtual data center for the cataloging and exchange of basic geotechnical, geologic, and geophysical data (ground investigations)
 - Primary motivation to support earthquake engineering research and related efforts
- COSMOS XML will be succeeded by DIGGS

Goals of the Exchange Standard

- Accommodate a wide variety of information and practices, but...
 - start out slow with respect to test results -
 - Pilot only contains test results determined most commonly desired by potential users
- No data loss (or as little as possible) when converting to the exchange format
- Expandable over time with minimal issues of backward incompatibility
- No requirement for data providers to change how they manage their business or organize their data

Other Requirements

- Descriptions of objects, activities, conditions, observations, and tests are kept separate in the model
- Data completeness and data quality addressed

Basic XML Structure

```
<GeotechnicalData>  
<posc:DocumentInformation> ... </posc:DocumentInformation> [0..1]  
<Site> ... </Site> [1]  
<_Tests> ... </_Tests> [0..*]  
<_Dictionaries> ... </_Dictionaries> [0..*]  
</GeotechnicalData>
```


Doc Info Element

```
<DocumentInformation  
  modver="1.1 [0..1]">  
  <DocumentName> identifierType </DocumentName> [1]  
  <DocumentAlias> identifierType </DocumentAlias> [0..*]  
  <DocumentDate> anyDate </DocumentDate> [0..1]  
  <_DocClasses> ... </_DocClasses> [0..*]  
  <FileCreationInformation> fileCrType </FileCreationInformation> [0..1]  
  <SecurityInformation> securityInfoType </SecurityInformation> [0..5]  
  <Disclaimer> xsd:string </Disclaimer> [0..1]  
  <AuditTrail> auditType </AuditTrail> [0..1]  
  <DataOwnerID> xsd:string </DataOwnerID> [0..1]  
  <Comment> xsd:string </Comment> [0..1]  
</DocumentInformation>
```

Site Element

```
<Site>
  <Hole>
    <Core>
      <Layer>
        <Component>...</Component>
        <Specimen>...</Specimen>
      </Layer>
      <Component>...</Component>
      <Specimen>...</Specimen>
    </Core>
    <Layer>
      <Component>...</Component>
      <Specimen>...</Specimen>
    </Layer>
    <Component>>...</Component>
    <Specimen>...</Specimen>
  </Hole>
</Site>
```

Site

- A collection of holes and samples obtained at a common place.
- Contains a spatial element
- Meant primarily where data from one hole can be referenced to another
- Can serve as an administrative grouping for holes, but this is not its intent.

Dictionaries Element

- <SupportingData>
- Start Choice [1..*]
- <BusinessAssociate> busAssocType
</BusinessAssociate> [1]
- <CoordReferenceSystem> crsDictType
</CoordReferenceSystem> [1]
- End Choice
- </SupportingData>

Hole

- A single sampling station, from which earth materials are collected or described, or earth material properties are measured. The sample may be from a core or cuttings from a borehole, surface excavation, or any other highly local sampling method. This term is used to represent the sample collecting activity as well as the sampling station.
- Contains a point location element
- No accommodation currently for hole path from non vertical or more than one inclination
- No elements yet to define construction (multiple construction intervals, depth-varying diameter, etc.)

Core

- An interval of earth materials, extracted or attempted to be extracted from a hole or site, using a specific type of sampling device, and where the physical locations of the ends of the Core are known in space. This term is used to represent both the sample collected as well as the interval within the hole that is sampled. If a physical sample of material is recovered from the interval, it is contained within the interval and is coherent, meaning that the material represents the relative position and properties of the strata or geological material in its in-situ condition. Material collected from a Core may be a) tested as a whole, b) further sub-sampled for geotechnical lab tests, c) described in detail, or d) subjected to geophysical tests, such as density scans, etc. Cores cannot overlap within a single hole.

Layer

- An interval of earth material in which the texture and physical character of the material are described. The layer is usually defined in terms of a scientific or vernacular classification system. No layers in a given hole defined within one classification system may overlap.

Component

- A physical feature or condition observed at a point or within an interval of earth material within a hole, typically described megascopically. A Component may represent a notable textural or lithologic feature within a layer, or some other physical, structural, diagenetic, mineralogical, biological, or geophysical characteristic. It also may represent a condition (temporal or persistent) described at a point or within an interval. A Component may exist within a Layer, or may extend across many Layers

Specimen

- A sample of earth material collected for the purpose of description or testing. A specimen may be collected directly from a hole or core, collected from the same Specimen material or from another Specimen.
- 1 specimen = 1 test

Tests Element

<Tests>

Start Choice [1..*]

<Atterberg> atterbergTableType </Atterberg> [1]

<ConePenetration> cptTableType </ConePenetration> [1]

<Moisture> moistureTableType </Moisture> [1]

<ParticleSize> partSizeTableType </ParticleSize> [1]

<StandardPenetration> sptTableType </StandardPenetration> [1]

<AdditionalTests> additionalType </AdditionalTests> [1]

End Choice

</Tests>

CPT

XML Instance Representation

```
<ConePenetration  
id=" keyid [0..1] "  
modver="1.0 [0..1]">  
<ID> codeSysElAttType </ID> [0..1]  
<FromHole> simpleRefType </FromHole> [0..1]  
<CPTParameters> cptParamType </CPTParameters> [0..1]  
<CPTData> cptDataType </CPTData> [0..*]  
<Remarks> xsd:string </Remarks> [0..1]  
</ConePenetration>
```

SPT

```
<...  
id=" keyid [0..1] ?"  
modver="1.0 [0..1]">  
<ID> codeSysElAttType </ID> [0..1]  
<FromHole> simpleRefType </FromHole> [0..1]  
<SPTParameters> sptParamType </SPTParameters> [0..1]  
<SPTData> sptDataType </SPTData> [0..*]  
<Remarks> xsd:string </Remarks> [0..1]  
</...>
```

Core produced is referenced in Core, esp. if otherwise described or sampled

Particle Size

- Particle size parameters
- Particle size data
- Other test attributes, for Atterberg and Moisture) are entirely contained within single tags.

Supporting Data

- Business Associate
 - The information about a business associate. The business associate may be a person, company, group, agency, or any other person or collection of persons that is related to the object.
- Coord Reference System
 - A coordinate reference system for which a set of coordinates is given. This object contains information that will either reference a standard CRS, or will define a local coordinate system particular to a site/ project.

Example XML File

DIGGS

Data Interchange for Geotechnical and Geoenvironmental Specialists

- New international data exchange standard developed by COSMOS, AGS, Univ. of Florida under the auspices of FHWA Pooled-Fund Study
- Builds on the experience and comprehensiveness of AGS, but contains more flexibility to handle additional data and maintains basic COSMOS philosophy.
- GML compliant
- Backward compatible with AGS
- Will hold additional geotechnical assets (e.g. piles, bridges, embankments) beyond ground investigations.
- Draft schema (ground investigations and tests, plus piles) due in Jan. 2006.

DIGGS Data Elements

- DocumentInformation
- projects
 - A collection of holes
- businessAssociates
 - Info on persons/entities associated with projects
- equipment
 - Info on equipment used
- standards
 - Definitions of standards used
- dictionary
 - Code lists, etc.

Basic Hierarchy

- projects
 - holes
 - can have path geometry (eg. deviated holes and traverses)
 - faces
 - 2D features (outcrop, pit faces, 2D seismic lines)
 - piles
 - etc...

Tests

- In-situ Tests (child of holes)
 - Full suite of AGS tests plus shear wave (downhole and PS logging), vane shear, container for other geophysics
- Lab Tests (child of Specimens)
 - Full suite of AGS tests, modified to be consistent with existing and 2L03 COSMOS lab tests

projects

```
<diggs:roles> diggs:RoleType </diggs:roles> [0..*]  
<diggs:issueNumber> integer </diggs:issueNumber> [1]  
<diggs:issueDate> date </diggs:issueDate> [1] ?  
<diggs:startDate> date </diggs:startDate> [0..1]  
<diggs:endDate> date </diggs:endDate> [0..1]  
<diggs:remarks> string </diggs:remarks> [0..1]  
<diggs:geometry> gml:GeometryArrayPropertyType </diggs:geometry> [0..1]  
<diggs:purpose> diggs:CodeListRefType </diggs:purpose> [0..*]  
<diggs:geodeticCoordinateSystem> diggs:CoordRefType  
  </diggs:geodeticCoordinateSystem> [0..1]  
<diggs:geodeticVerticalDatum> diggs:CoordRefType  
  </diggs:geodeticVerticalDatum> [0..1]  
<diggs:localCoordinateSystem> diggs:CoordRefType  
  </diggs:localCoordinateSystem> [0..1]  
<diggs:localVerticalDatum> diggs:CoordRefType </diggs:localVerticalDatum> [0..1]  
<diggs:holes> ... </diggs:holes> [0..1]
```

holes

```
<diggs:geometry> gml:GeometryArrayPropertyType </diggs:geometry> [1]
<diggs:location> string </diggs:location> [0..*]
<diggs:referenceDatumDescription> diggs:CodeListRefType </diggs:referenceDatumDescription> [0..1]
<diggs:groundLevelGeodeticCoordinates> gml:PointPropertyType </diggs:groundLevelGeodeticCoordinates> [0..*]
<diggs:groundLevelLocalCoordinates> gml:PointPropertyType </diggs:groundLevelLocalCoordinates> [0..*]
<diggs:groundLevelGeodeticElevation> gml:PointPropertyType </diggs:groundLevelGeodeticElevation> [0..*]
<diggs:groundLevelLocalElevation> gml:PointPropertyType </diggs:groundLevelLocalElevation> [0..*]
<diggs:referenceLocationGeodeticCoordinates> gml:PointPropertyType </diggs:referenceLocationGeodeticCoordinates> [0..*]
<diggs:referenceLocationLocalCoordinates> gml:PointPropertyType </diggs:referenceLocationLocalCoordinates> [0..*]
<diggs:referenceLocationGeodeticElevation> gml:PointPropertyType </diggs:referenceLocationGeodeticElevation> [0..*]
<diggs:referenceLocationLocalElevation> gml:PointPropertyType </diggs:referenceLocationLocalElevation> [0..*]
<diggs:status> string </diggs:status> [0..1]
<diggs:remarks> string </diggs:remarks> [0..1]
<diggs:backFill> date </diggs:backFill> [0..1]
<diggs:type> diggs:CodeListRefType </diggs:type> [1]
<diggs:purpose> string </diggs:purpose> [0..1]
<diggs:trialPitLength> diggs:MeasurementType </diggs:trialPitLength> [0..1]
<diggs:trialPitWidth> diggs:MeasurementType </diggs:trialPitWidth> [0..1]
<diggs:roles> diggs:RoleType </diggs:roles> [0..*]
<diggs:surfaceWaterDepth> diggs:MeasurementType </diggs:surfaceWaterDepth> [0..1]
<diggs:files> ... </diggs:files> [0..1]
<diggs:Samples> ... </diggs:Samples> [0..1]
<diggs:_groundInformation> ... </diggs:_groundInformation> [0..1]
```

groundInformation

```
<diggs:Detail> diggs:DetailType
  <diggs:baseDepth> diggs:MeasurementType </diggs:baseDepth> [0..1]
  <diggs:topDepth> diggs:MeasurementType </diggs:topDepth> [1]
  <diggs:description> diggs:GeomaterialTableType </diggs:description> [0..1]
  <diggs:layerSystem> string </diggs:layerSystem> [0..1]
  <diggs:roles> diggs:RoleType </diggs:roles> [0..*]
</diggs:Detail> [0..*]
<diggs:Layer> diggs:LayerType
  <diggs:description> diggs:GeomaterialTableType </diggs:description> [0..1]
  <diggs:basisOfLayer> string </diggs:basisOfLayer> [0..1]
  <diggs:topBoundaryDescription> diggs:BoundaryTableType
    </diggs:topBoundaryDescription> [0..1]
  <diggs:baseBoundaryDescription> diggs:BoundaryTableType
    </diggs:baseBoundaryDescription> [0..1]
  <diggs:depthBase> gml:MeasureType </diggs:depthBase> [1]
  <diggs:depthTop> gml:MeasureType </diggs:depthTop> [1]
  <diggs:layerSystem> string </diggs:layerSystem> [0..1]
  <diggs:roles> diggs:RoleType </diggs:roles> [0..*]
</diggs:Layer> [0..*]
```


Samples

```
<diggs:samplingDateTime> dateTime </diggs:samplingDateTime> [0..1]
<diggs:temperature> diggs:MeasurementType </diggs:temperature> [0..1]
<diggs:remarks> string </diggs:remarks> [0..1]
<diggs:gasFlow> diggs:MeasurementType </diggs:gasFlow> [0..1]
<diggs:description> diggs:GeomaterialTableType </diggs:description> [0..1]
<diggs:type> diggs:CodeListRefType </diggs:type> [0..1]
<diggs:depthBase> diggs:MeasureType </diggs:depthBase> [0..1]
<diggs:barometricPressure> diggs:MeasureType </diggs:barometricPressure> [0..1]
<diggs:preparation> string </diggs:preparation> [0..1]
<diggs:stratumReference> string </diggs:stratumReference> [0..1]
<diggs:diameter> diggs:MeasureType </diggs:diameter> [0..1]
<diggs:numberOfBlows> int </diggs:numberOfBlows> [0..1]
<diggs:depthTop> diggs:MeasureType </diggs:depthTop> [0..1]
<diggs:assumedDepthTop> diggs:MeasureType </diggs:assumedDepthTop> [0..1]
<diggs:assumedDepthBase> diggs:MeasureType </diggs:assumedDepthBase> [0..1]
<diggs:recoveredLength> diggs:MeasureType </diggs:recoveredLength> [0..1]
<diggs:gasPressure> diggs:MeasurementType </diggs:gasPressure> [0..1]
<diggs:waterDepth> diggs:MeasureType </diggs:waterDepth> [0..1]
<diggs:rockQualityDesignation> double </diggs:rockQualityDesignation> [0..1]
<diggs:solidCoreRecovery> double </diggs:solidCoreRecovery> [0..1]
<diggs:totalCoreRecovery> double </diggs:totalCoreRecovery> [0..1]
<diggs:roles> diggs:RoleType </diggs:roles> [0..*]
<diggs:Specimens> ... </diggs:Specimens> [0..1]
<diggs:files> ... </diggs:files> [0..1]
```

Specimens

```
<diggs:depthTop> diggs:MeasureType </diggs:depthTop> [1]
<diggs:depthBase> diggs:MeasureType </diggs:depthBase> [1]
<diggs:remarks> string </diggs:remarks> [1]
<diggs:subsamplingMethod> diggs:CodeListRefType
  </diggs:subsamplingMethod> [0..1]
<diggs:roles> diggs:RoleType </diggs:roles> [0..*]
<diggs:description> diggs:GeomaterialTableType
  </diggs:description> [0..1]
<diggs:_labTests> ... </diggs:_labTests> [0..*]
```

Example XML File

Becoming a Data Provider: USGS Experience

**Workshop on the Implementation of
COSMOS/PEER-LL GVDC**

Memphis, Tennessee

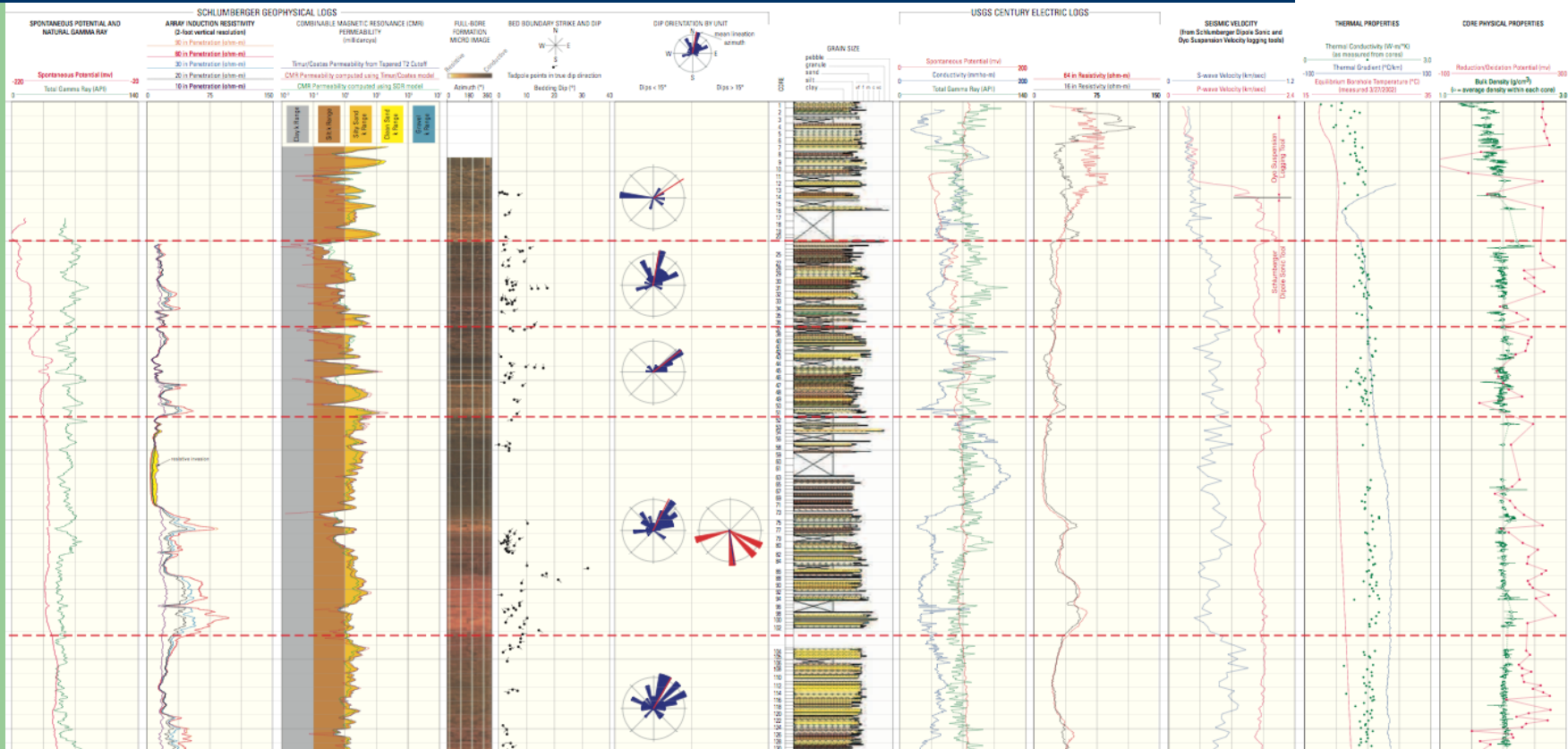
October 5-6, 2005

Daniel J. Ponti, USGS

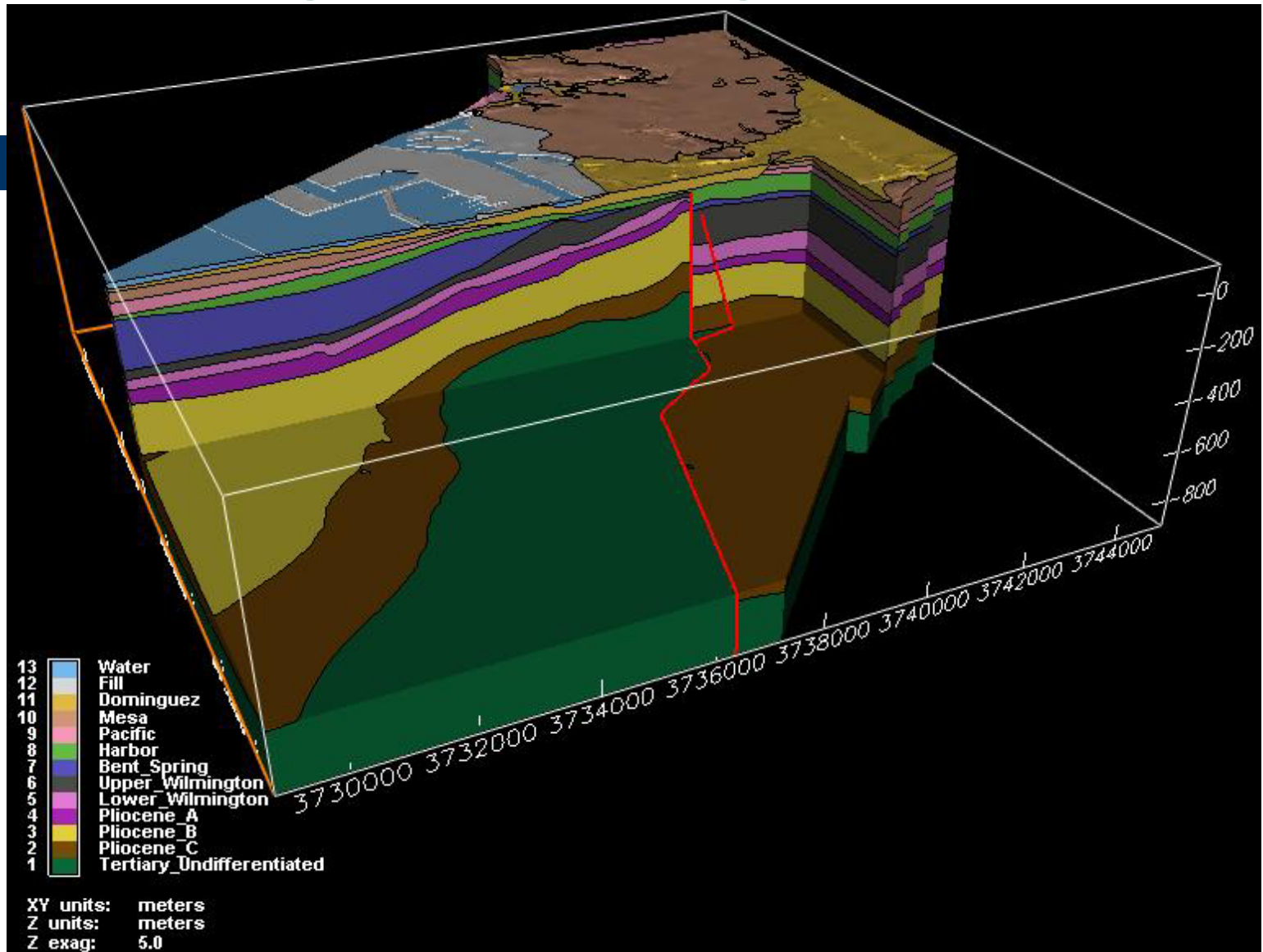
FOQUS-LA Corehole and Well Database

- Support geologic and ground water modeling projects supported by USGS in the Los Angeles region
- Repository for detailed core and pore fluid chemical analyses conducted by USGS using in-house developed FileMaker-based core logging system
- Centralized access to broad range of subsurface information from various sources

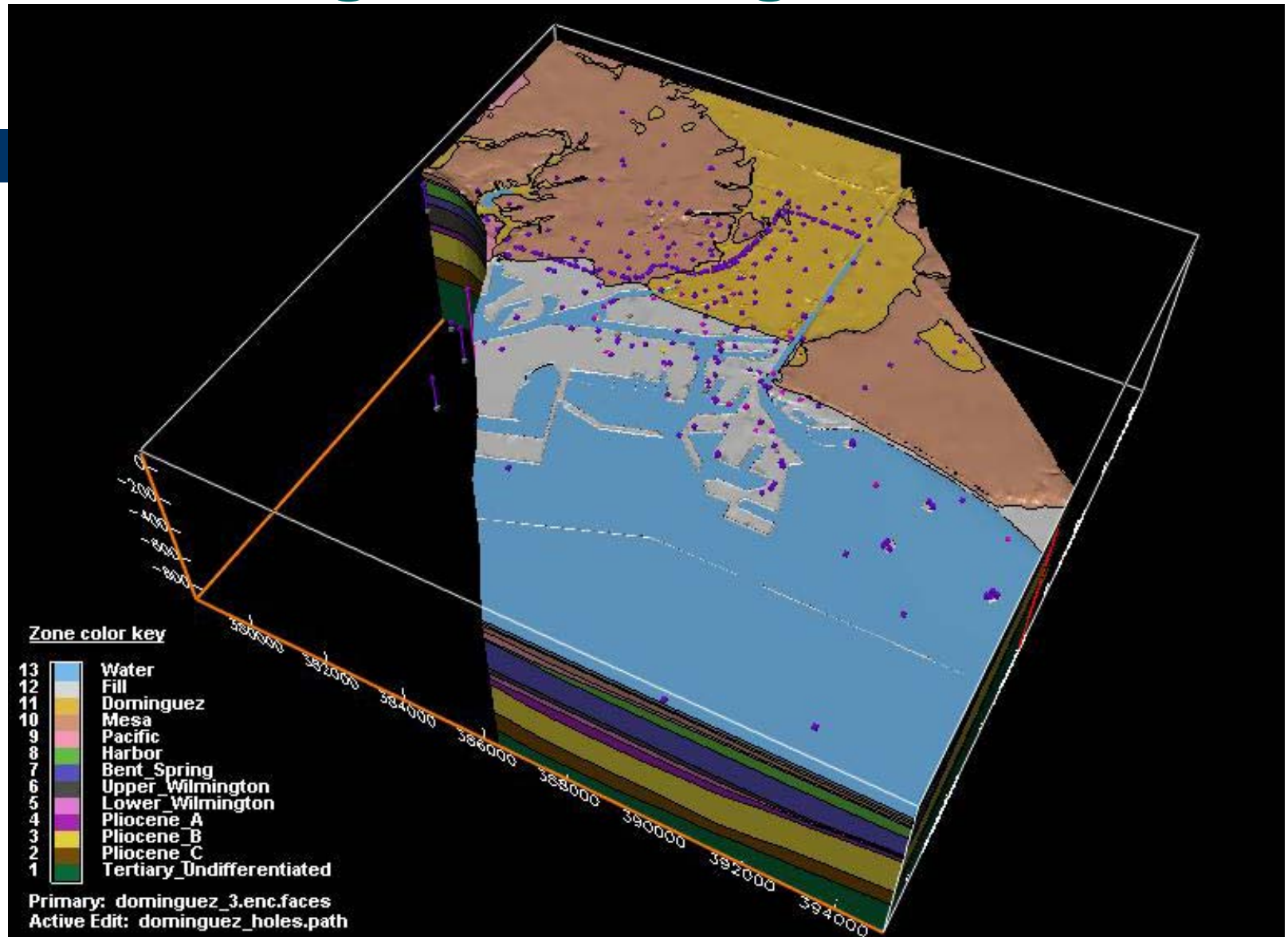
Reference Section Core Holes for Sequence-Stratigraphic Analysis



3D Geologic Modeling



3D Geologic Modeling

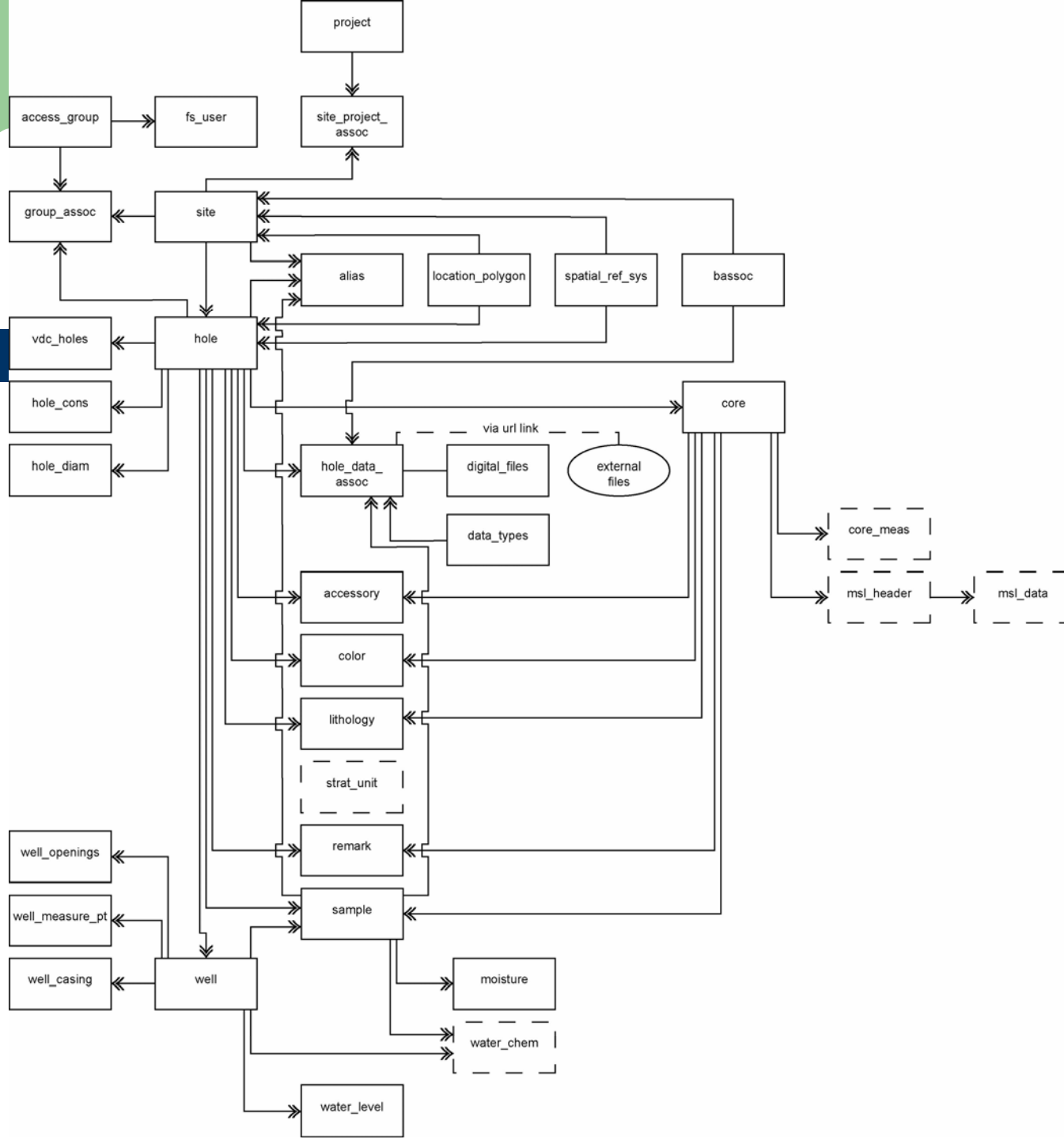


Data Repository Status

- ~7000 driller logs (water wells) as analog paper files
 - ~200 have been digitized (AppleCore, Rockworks, Excel)
 - ~300 logs scanned as document files (pdf)
 - ~300 water well have analog electric logs
 - ~100 logs have been digitized (Excel)
- ~1000 oil well electric logs as analog paper files
 - ~100 logs have been digitized (Excel) plus several dozen electric logs in LAS format files
- ~30 detailed logs and core logs with multiple kinds of data in a Filemaker database.
 - Multiple geophysical logs, detailed core descriptions, PS logs to depths of 1500 feet.

Getting it Organized

- PostgreSQL database engine with geospatial extensions (PostGIS, Proj4 libraries) serves as master repository
 - Most well locations with metadata included, some downhole geologic data (from Filemaker database), well construction and water level information
 - Additional downhole data will eventually be migrated from other files and Filemaker database
 - Considering migration of Filemaker core-logging system to Postgres in the future
- Java-based user interface using commercial Servoy application development and deployment environment plus in-house developed map interface (USGS and LACDPW collaborative)
- Web-based interface for viewing basic data planned



Los Angeles County Department of Public Works Well Inventory Database



New Search

Select: Hole or Well Name

and Project

and City

<Any Name>

<Any Project>

<Any City>

GO

or Select from Map -->

85 holes selected

| Omit | Map | Hole Name | Wells |
|------|-----|-------------------------------------|-------|
| X | | 997 | |
| X | | 998C | |
| X | | 998F | |
| X | | Armstrong Petroleum Corp. Long Be | |
| X | | City of Long Beach Core Hole 1 | |
| X | | City of Long Beach Core Hole 4 | |
| X | | City of Long Beach Core Hole 5 | |
| X | | City of Long Beach Core Hole 6 | |
| X | | City of Long Beach Core Hole 8 | |
| X | | City of Long Beach Development We | |
| X | | Grover Collins City of Long Beach 1 | |
| X | | LONG BEACH OIL W-132 | |
| X | | Long Beach #31A | |
| X | | Long Beach - Cabrillo High School | |
| X | | Long Beach - Pier C | |
| X | | Long Beach - Pier F | |
| X | | Long Beach - Webster | |
| X | | Long Beach City College | |
| X | | Long Beach O. D. FG-1 | |
| X | | Long Beach O. D. L-165 | |
| X | | Long Beach O. D. X-44 | |
| X | | Long Beach O. D. X-89 | |
| X | | Long Beach O. D. Y-112 | |
| X | | Long Beach O. D. Y-126 | |
| X | | Long Beach Water Treatment | |
| X | | Long Beach-1 | |
| X | | Long Beach-2 | |
| X | | THUMS Long Beach Co. A-148 I | |
| X | | THUMS Long Beach Co. A-210 | |

HOLE: Long Beach - Webster

NAMING SYSTEM: USGS Common Name

REFERENCE ELEVATION: 23.1 feet (NGVD29, Measured from: Land Surface)

HOLE DEPTH: 1,404 feet (Source: Measured by personnel of the reporting agency)

General Information

Hole Type: Multiple wells
Topographic Setting: Floodplain
Owner or Organization: Water Replenishment District of Southern California
Reporting Agency: USGS
Data Reliability: Data field checked
General Remarks:

Other Names (Naming System)

004S013W23D003S (Calif. State Well No.)
 004S013W23D004S (Calif. State Well No.)
 004S013W23D005S (Calif. State Well No.)
 004S013W23D006S (Calif. State Well No.)

HOLE CONSTRUCTION

| Start Date | End Date | Construction Method | Equipment |
|------------|------------|---------------------|----------------------|
| 2000-07-10 | 2000-08-04 | Hydraulic rotary | Ingersoll Rand TH-75 |

HOLE DIAMETER

| From | To | Diameter |
|------------|--------------|----------|
| 0.0 feet | 493.0 feet | 12.3 in |
| 493.0 feet | 1,113.0 feet | 9.9 in |

| From (feet) | To | Data Type | Data Format | Media | Remarks |
|-------------|------|-----------------|---------------------|-----------|--------------------------|
| 0 | 1276 | Core Log | In Database | | |
| 0 | 5 | Core Photograph | Electronic Document | Adobe PDF | Download |
| 5 | 11 | Core Photograph | Electronic Document | Adobe PDF | Download |
| 11 | 16 | Core Photograph | Electronic Document | Adobe PDF | Download |
| 16 | 21 | Core Photograph | Electronic Document | Adobe PDF | Download |

| Longitude | Latitude | Coordinate Reference System |
|------------|----------|-----------------------------|
| -118.21758 | 33.81802 | |

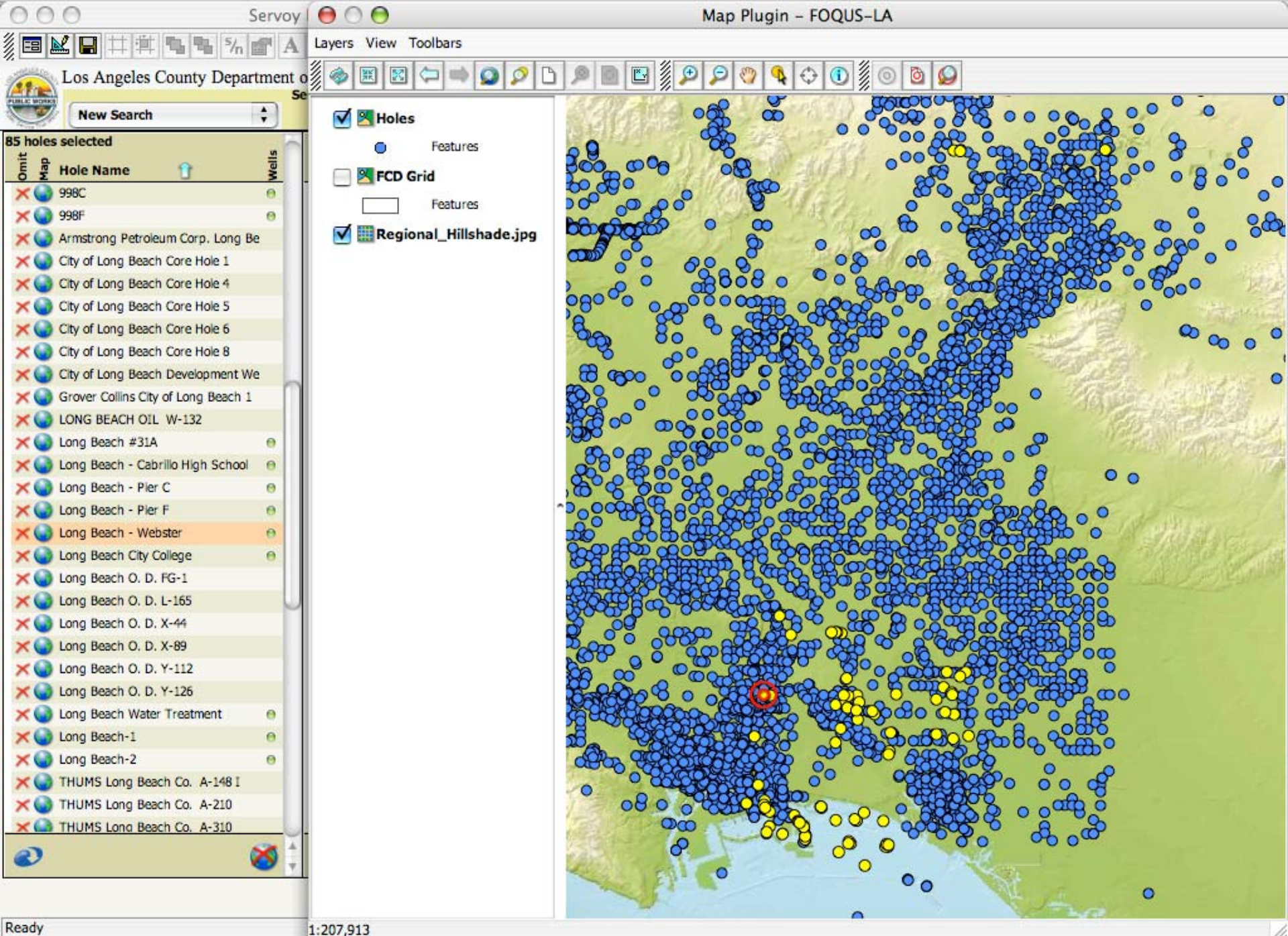
Location Method: GPS, uncorrected
 (Map used: Long Beach; scale: 24000)

Accuracy Estimate: Accurate to 0.5 sec (~15 m)**Address:****Land Grid:** T04S, R13W, Sec. 23 (San Bernardino Base and Meridian)**City:** LONG BEACH**USGS Quad:** LONG BEACH**Location Remarks:****Elevation Method:** Level or other surveying method**Elevation Accuracy:****Input Ground Elev:** 23.10 ft**NAVD88 Ground****Elev.:****NAVD88 Ref.****Elevation:**

Elevation Remarks: WRDSC surveyed the top of the well vault at 24.6', reported to be about 1.5' above land surface. Datum assumed to be NGVD29

Digitize coordinate from map





Database Content vs. GVDC

- Currently 8138 holes at 8100 sites
 - Site Types
 - Water wells (6705)
 - Oil Wells (965)
 - Geotechnical/Stratigraphic (430)
 - Released to GVDC Pilot
 - 1478 holes
 - USGS Water wells (including core holes)
 - LACDPW barrier water wells
 - MetroRail geotechnical borings
 - Hole metadata (eg. location and available data info)
 - Geologic (Layer and Component) and Moisture Content data
 - Released core holes

General Issues for Supporting GVDC Access

- Data
 - Dynamic content (information at various levels of detail and completeness and changing through time)
 - At what point is data releasable?
 - Proprietary content
 - Release/review requirements
- Security
- Development and Maintenance Support
 - Little or no modification to existing database structure and practice
 - No specific maintenance requirements to support VDC access

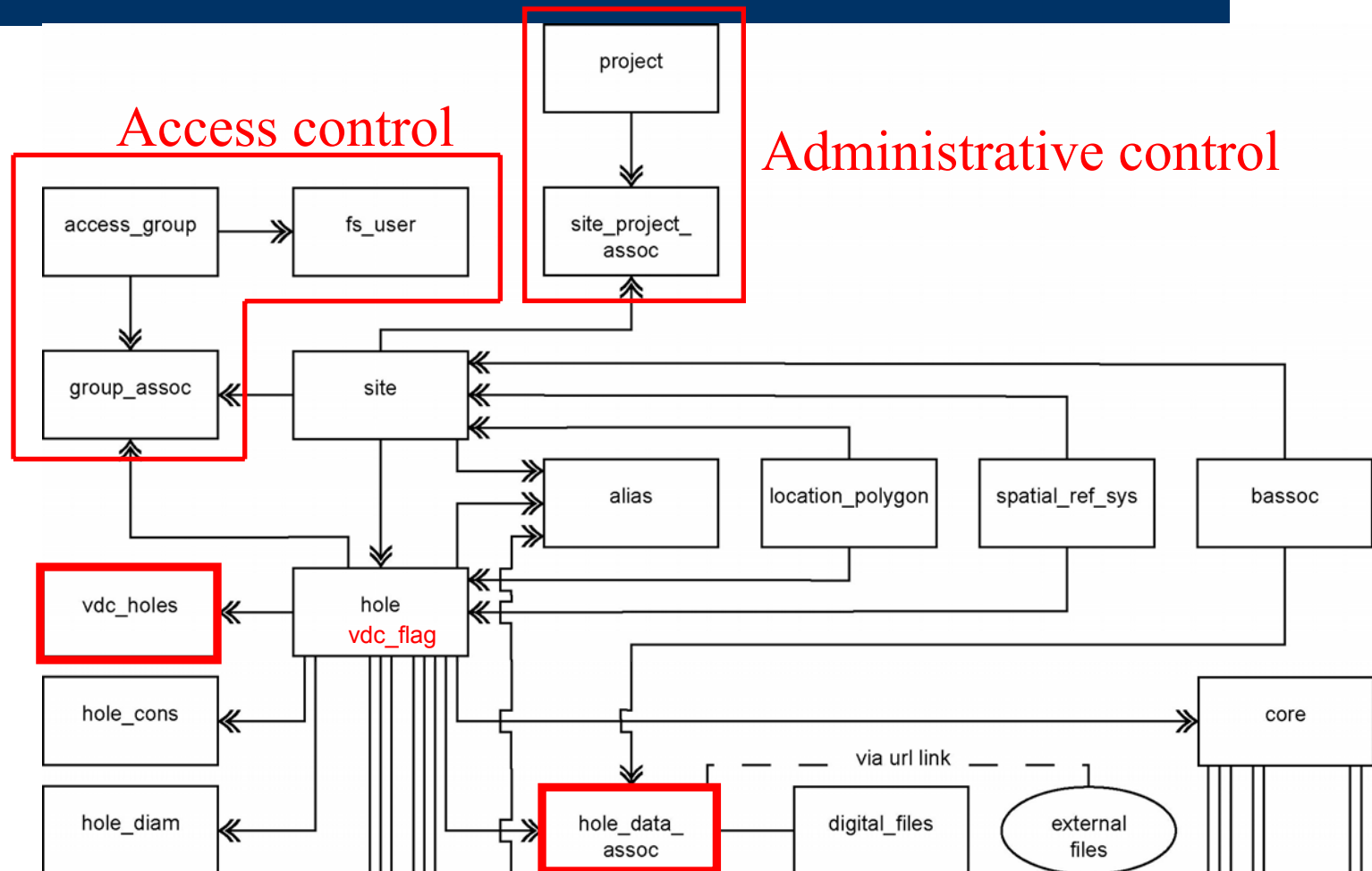
Implementing COSMOS GVDC Access

- Data harvesting
 - Allowing the GVDC to talk to you
 - Must have an SQL database with JDBC interface and Java servlet container (Tomcat) to harvest using OAIB
- Data export to end user (COSMOS/DIGGS XML)
 - Providing your data to the end user

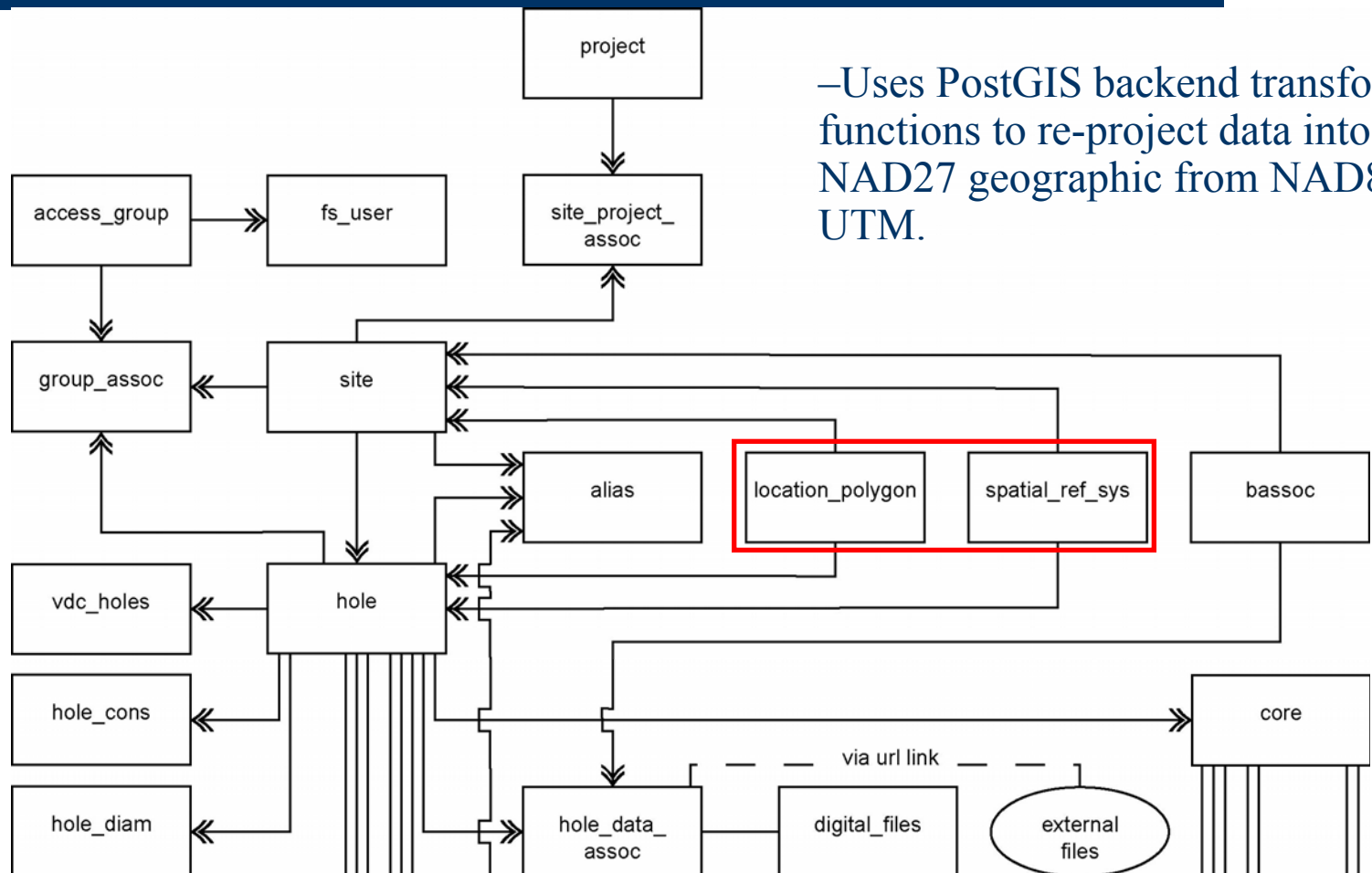
Data Harvesting Using OAIB

- Which data?
- 1 record per data type per hole
- Only a single table can be queried
 - Will probably need to set up views
- No null data (hopefully will be fixed)
- Last modification date must be known
- Hole coordinates must be in standardized coordinate system (NAD27 geographic)
 - Hopefully will be fixed
- Firewall access to GVDC server

Modifying USGS DB access for COSMOS GVDC



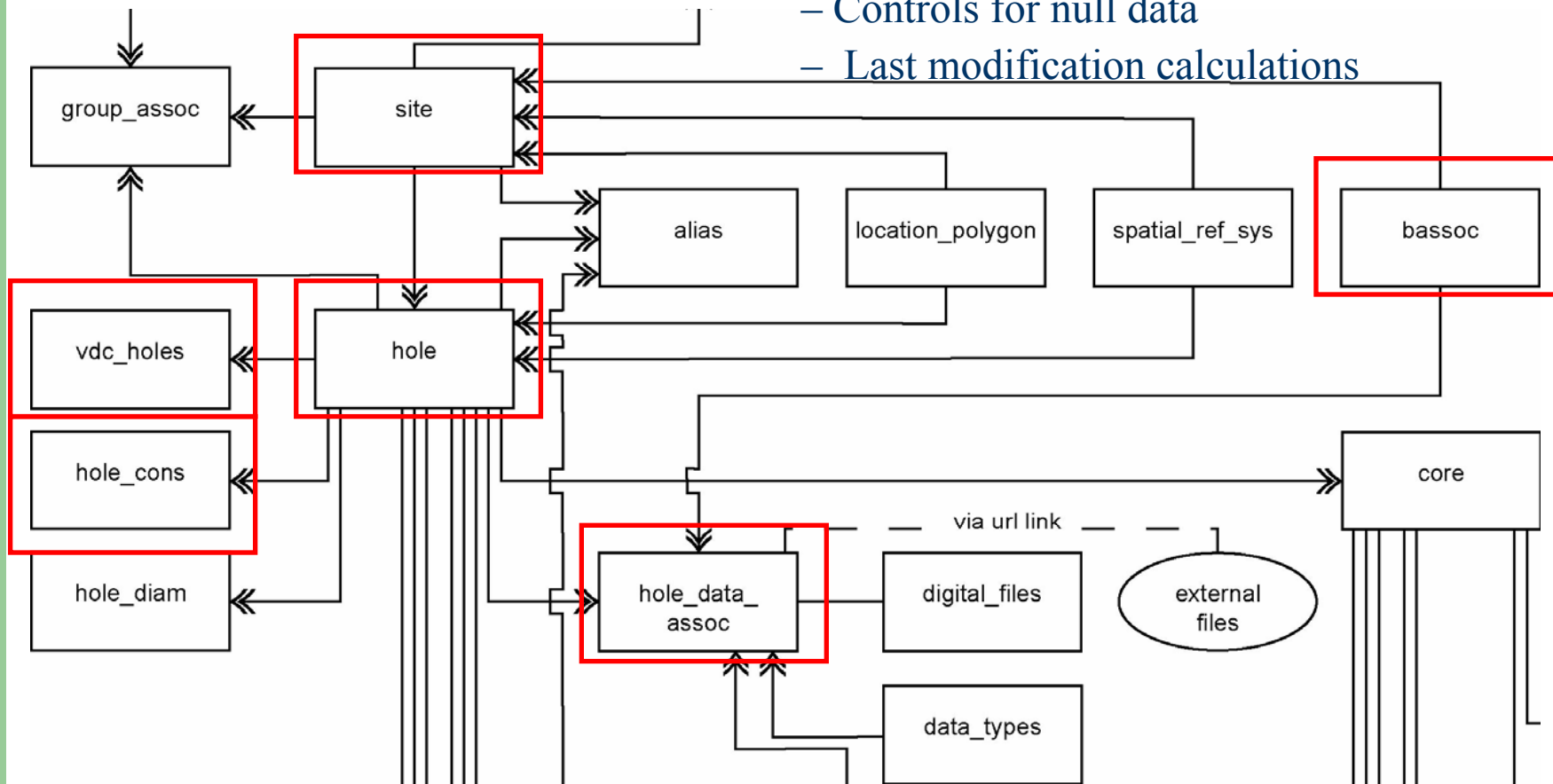
Modifying USGS DB access for COSMOS GVDC



–Uses PostGIS backend transform functions to re-project data into NAD27 geographic from NAD83 UTM.

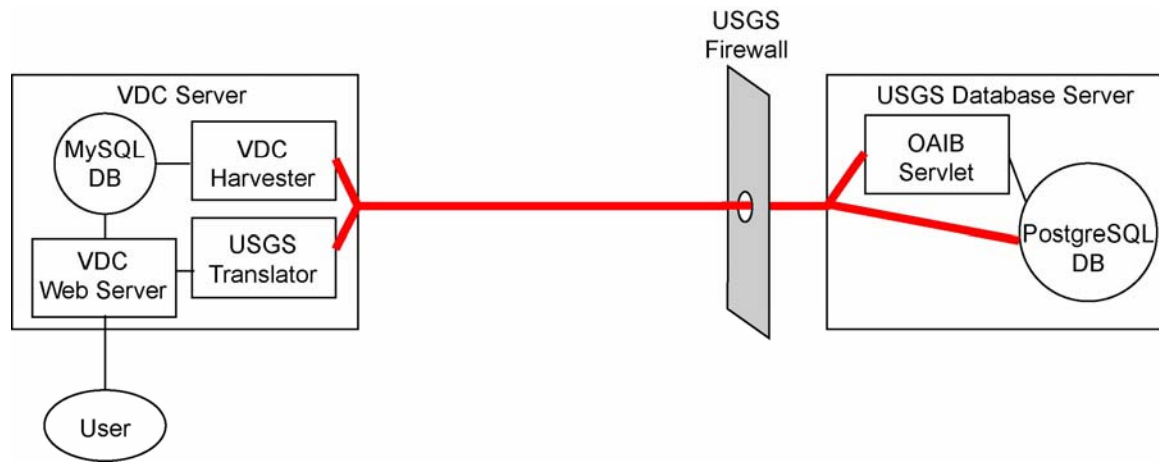
OAIB Accesses a View plus Back-end Stored Procedures

- 1 record per data type per hole generated
- Controls for null data
- Last modification calculations



Data Transfer via COSMOS XML

- Latest generation of XML at user's request to ensure delivery of "latest" data
 - Eliminates need for manual update of XML files
- Translator exists as Java servlet on GVDC server
 - Allows for extraction of data without direct access by user's computer to database



USGS XML Translator Development

- Data Mapping
 - Most difficult part
 - Development of additional backend stored procedures and views
 - Translation of controlled lists
- Translator Code
 - Used Castor open-source XML binding software
 - Reads schema file (.xsd)
 - Developer supplies SQL to define data mapping



XML file

- Additional programming required
 - Total ~3 man-weeks development

Select statement for Component View

```
select
'USGS_FOQUS_ID':text as codespace,
accessory.id as id,
accessory.hole_id as hole_id,
accessory.core_id as core_id,
CASE WHEN accessory.described_from = 'CPT' THEN 'CPT' WHEN accessory.described_from = 'Core' THEN 'core' WHEN accessory.described_from = 'Cuttings' THEN 'cuttings' WHEN accessory.described_from = 'Estimate' THEN 'estimate'
WHEN accessory.described_from = 'Geophysical log' THEN 'geophysical log' WHEN accessory.described_from = 'Mud' THEN 'Other: mud' WHEN accessory.described_from = 'Multiple Sources' THEN 'Other: multiple' WHEN
accessory.described_from = 'Other' THEN 'Other: other' WHEN accessory.described_from = 'Outcrop' THEN 'outcrop' ELSE 'unknown' END as source,
'ft':text as uom,
cvtunit(depthcalc(accessory.acc_from,accessory.depth_uom,accessory.measurement_datum,accessory.core_id),'m','ft') as comp_from,
cvtunit(depthcalc(accessory.acc_to,accessory.depth_uom,accessory.measurement_datum,accessory.core_id),'m','ft') as comp_to,
null:text as class_system,
acc_codes.type_description as comp_type,
acc_codes.description as description,
vdcabundtext(accessory.acccode,accessory.abundcode) as abundance,
hole.reporting_agency as data_source,
getlastmoddate('accessory',accessory.id) as last_updated

from accessory, acc_codes, hole
where accessory.acccode = acc_codes.code and accessory.hole_id = hole.id

union all

Select
'USGS_FOQUS_ID':text as codespace,
color.id as id,
color.hole_id as hole_id,
color.core_id as core_id,
CASE WHEN color.described_from = 'CPT' THEN 'CPT' WHEN color.described_from = 'Core' THEN 'core' WHEN color.described_from = 'Cuttings' THEN 'cuttings' WHEN color.described_from = 'Estimate' THEN 'estimate' WHEN
color.described_from = 'Geophysical log' THEN 'geophysical log' WHEN color.described_from = 'Mud' THEN 'Other: mud' WHEN color.described_from = 'Multiple Sources' THEN 'Other: multiple' WHEN color.described_from = 'Other' THEN
'Other: other' WHEN color.described_from = 'Outcrop' THEN 'outcrop' ELSE 'unknown' END as source,
'ft':text as uom,
cvtunit(depthcalc(color.clr_from,color.depth_uom,color.measurement_datum,color.core_id),'m','ft') as comp_from,
cvtunit(depthcalc(color.clr_to,color.depth_uom,color.measurement_datum,color.core_id),'m','ft') as comp_to,
CASE WHEN color.munsell1 is not null THEN 'Munsell' ELSE null:text END as class_system,
'Color' as comp_type,
vdccolortext(color.id) as description,
null as abundance,
hole.reporting_agency as data_source,
getlastmoddate('color',color.id) as last_updated

from color, hole
where color.hole_id = hole.id

union all
```

Select statement for Component View

```
Select
'USGS_FOQUS_ID'::text as codespace,
remark.id as id,
remark.hole_id as hole_id,
remark.core_id as core_id,
CASE WHEN remark.described_from = 'CPT' THEN 'CPT' WHEN remark.described_from = 'Core' THEN 'core' WHEN remark.described_from = 'Cuttings' THEN 'cuttings' WHEN remark.described_from = 'Estimate' THEN
'estimate' WHEN remark.described_from = 'Geophysical log' THEN 'geophysical log' WHEN remark.described_from = 'Mud' THEN 'Other: mud' WHEN remark.described_from = 'Multiple Sources' THEN 'Other:
multiple' WHEN remark.described_from = 'Other' THEN 'Other: other' WHEN remark.described_from = 'Outcrop' THEN 'outcrop' ELSE 'unknown' END as source,
'ft'::text as uom,
cvtunit(depthcalc(remark.rem_from,remark.depth_uom,remark.measurement_datum,remark.core_id),'m','ft') as comp_from,
cvtunit(depthcalc(remark.rem_to,remark.depth_uom,remark.measurement_datum,remark.core_id),'m','ft') as comp_to,
null::text as class_system,
'Remark' as comp_type,
remark.rem_text as description,
null::text as abundance,
hole.reporting_agency as data_source,
getlastmoddate('remark',remark.id) as last_updated

from remark, hole where remark.hole_id = hole.id
```


Conclusions

- Able to adequately meet agency/project needs for
 - Minimal alteration of existing database schema
 - Security and access requirements
 - Ease of maintenance
- Fair amount of up-front labor costs to support GVDC
 - Dominantly one-time expenditures
- Unknown future effort to maintain translator as schema and database both evolve.

Becoming a Data Provider: Caltrans Experience

**Workshop on the Implementation of
COSMOS/PEER-LL GVDC**

Memphis, Tennessee

October 5-6, 2005

Loren Turner, Caltrans

Overview

- The data that was provided
- Overview of the agency's in house data management system
- Connecting to the GVDC
- Translators

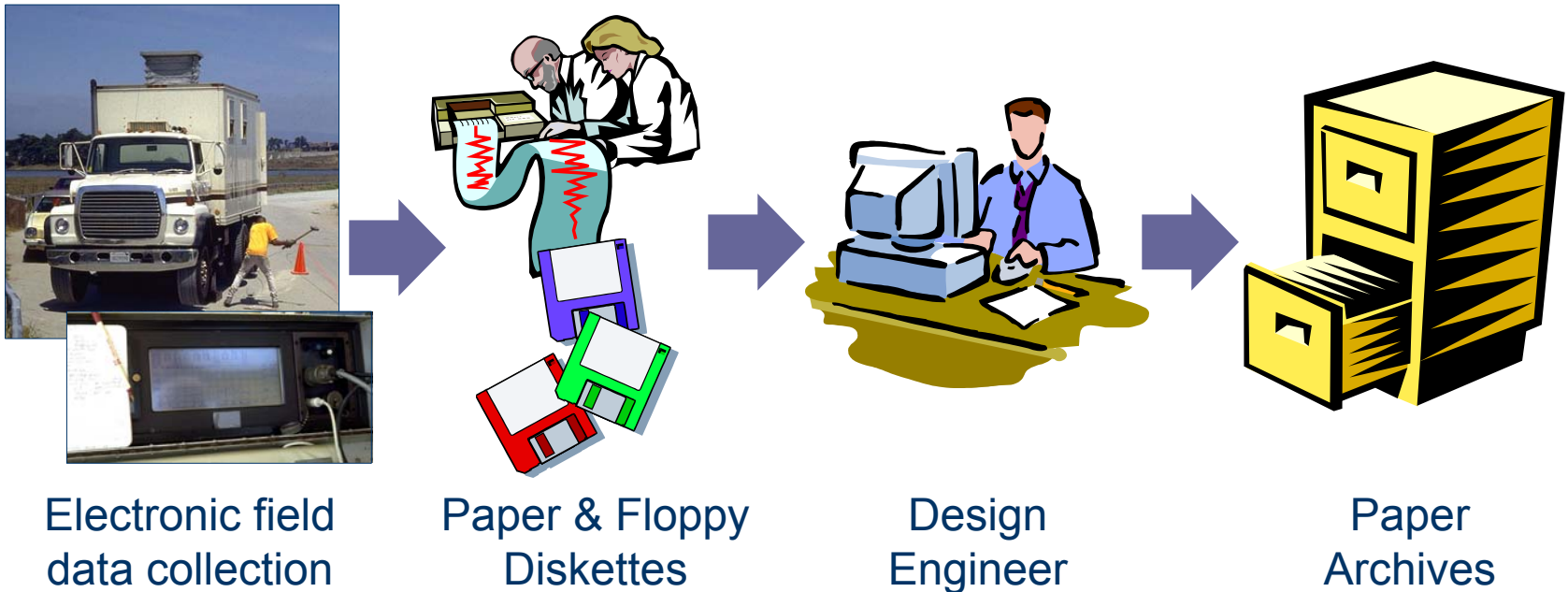
Caltrans Cone Penetration Test (CPT)

- Caltrans has a mobile testing unit that is deployed statewide.
- Approximately 350 soundings per year.
- Digital archives currently contain 10 years of data (>3300 records).



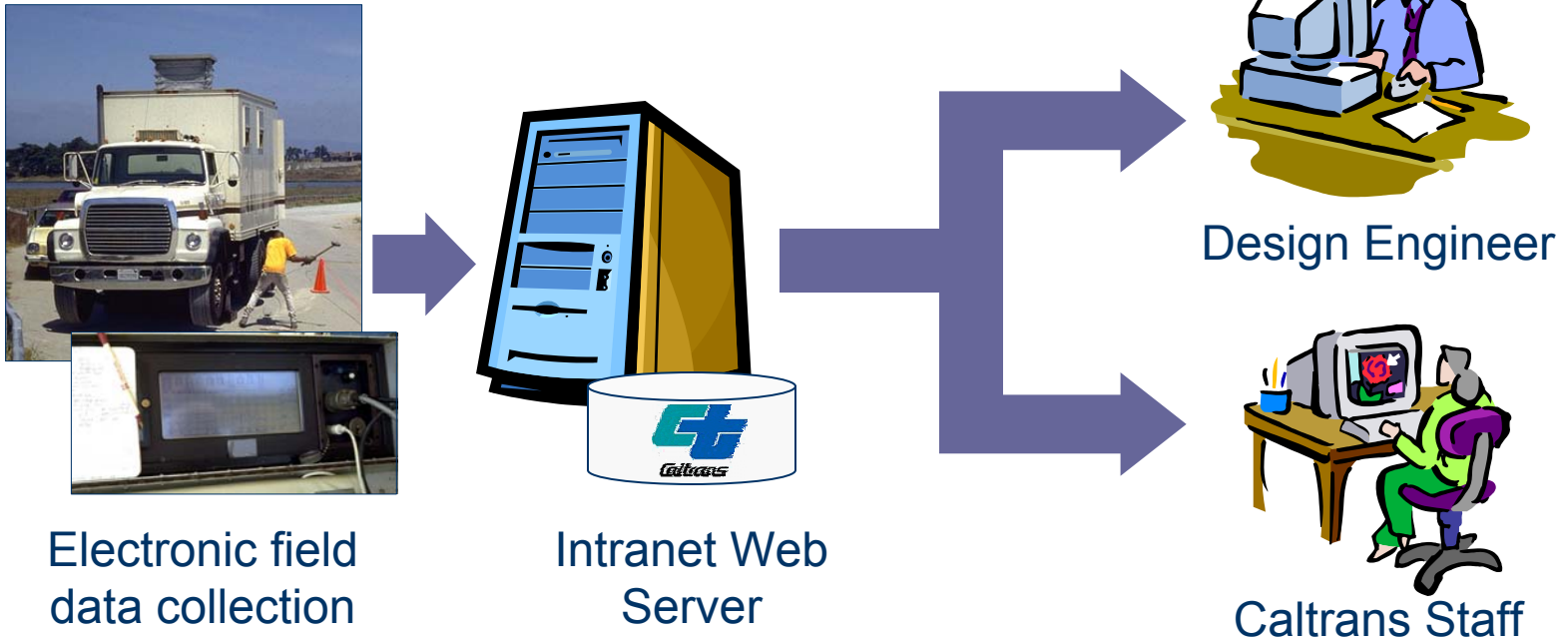
Data Management Process

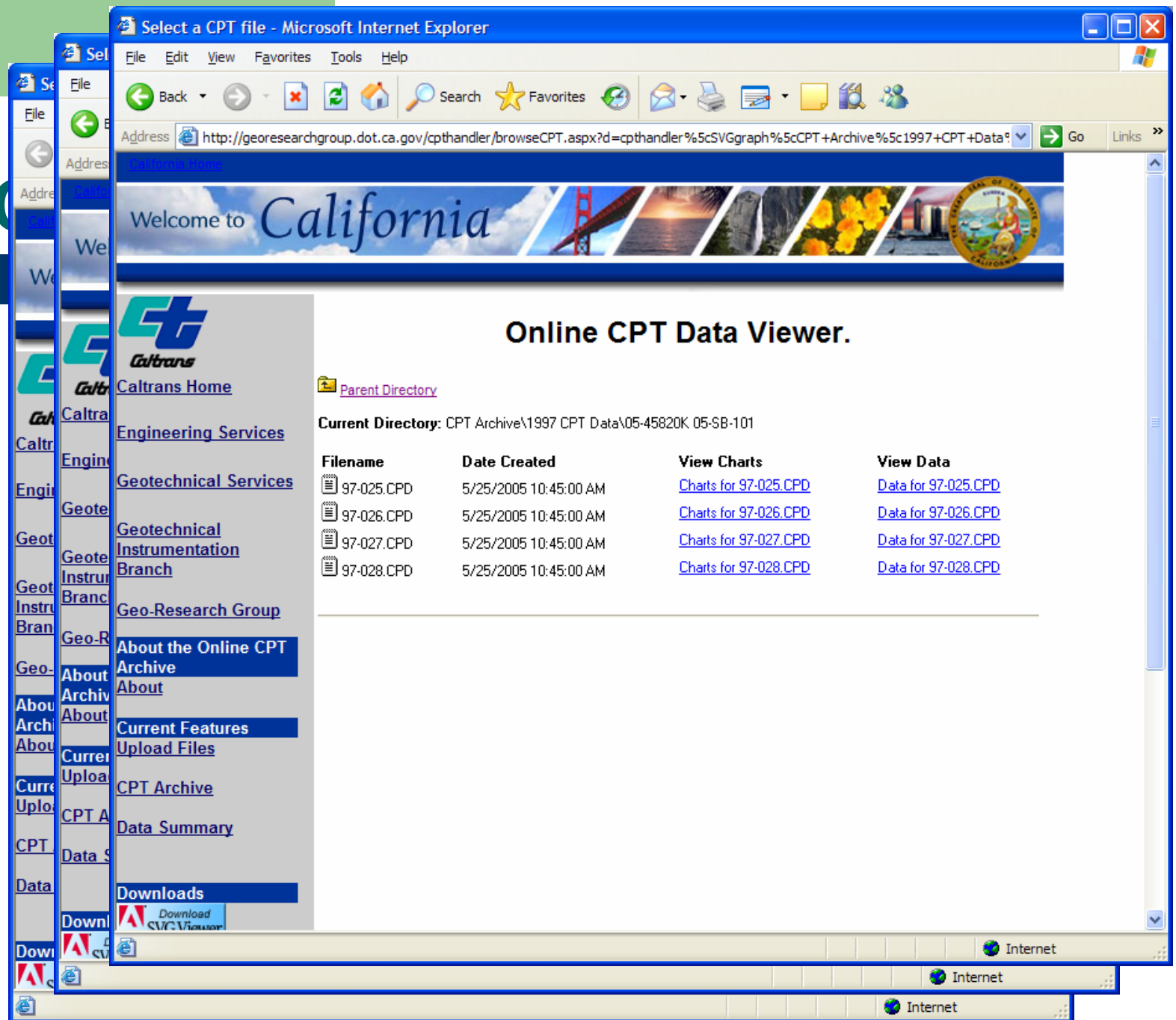
- Prior to 2002, data was not widely accessible.



Data Management Process

- In 2002 a web dissemination system was implemented.



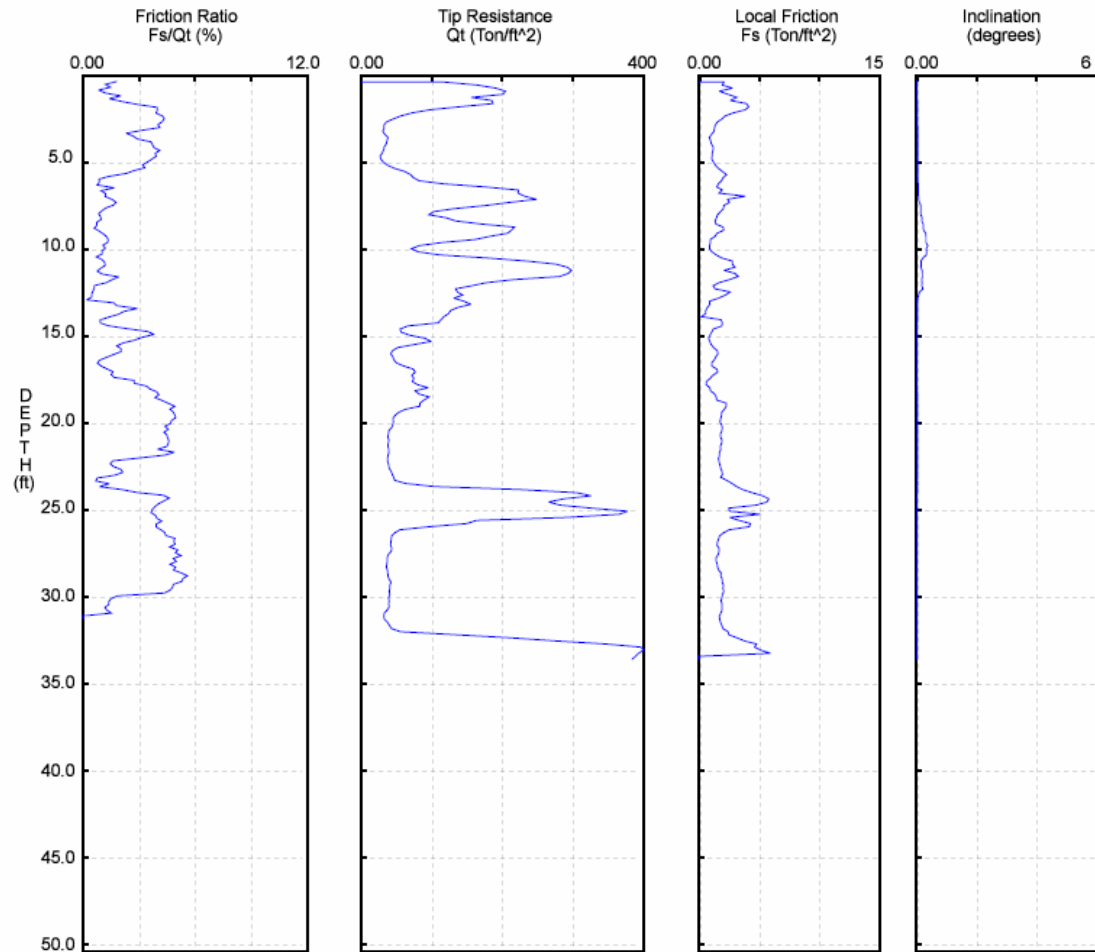


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| 0.25 | 131.9 | 5.071 | 0.85 |
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| 0.65 | 131.8 | 2.725 | 0.95 |
| 0.70 | 116.0 | 2.246 | 0.95 |
| 0.75 | 100.6 | 1.929 | 0.95 |
| 0.80 | 85.9 | 1.495 | 1.13 |
| 0.85 | 78.4 | 1.208 | 1.15 |
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| 1.20 | 77.4 | 1.064 | 1.17 |
| 1.25 | 78.3 | 1.117 | 1.23 |
| 1.30 | 73.4 | 0.992 | 1.23 |
| 1.35 | 63.8 | 0.985 | 1.28 |
| 1.40 | 57.8 | 0.971 | 1.26 |
| 1.45 | 48.9 | 0.915 | 1.26 |
| 1.50 | 43.3 | 0.658 | 1.25 |
| 1.55 | 39.3 | 0.435 | 1.25 |
| 1.60 | 41.4 | 0.741 | 1.25 |
| 1.65 | 42.1 | 1.155 | 1.26 |
| 1.70 | 40.8 | 1.377 | 1.26 |
| 1.75 | 37.6 | 1.324 | 1.21 |
| 1.80 | 38.8 | 1.630 | 1.28 |
| 1.85 | 34.2 | 1.657 | 1.26 |
| 1.90 | 32.8 | 1.635 | 1.26 |
| 1.95 | 29.1 | 1.536 | 1.26 |
| 2.00 | 27.7 | 1.588 | 1.26 |
| 2.05 | 25.0 | 1.611 | 1.26 |

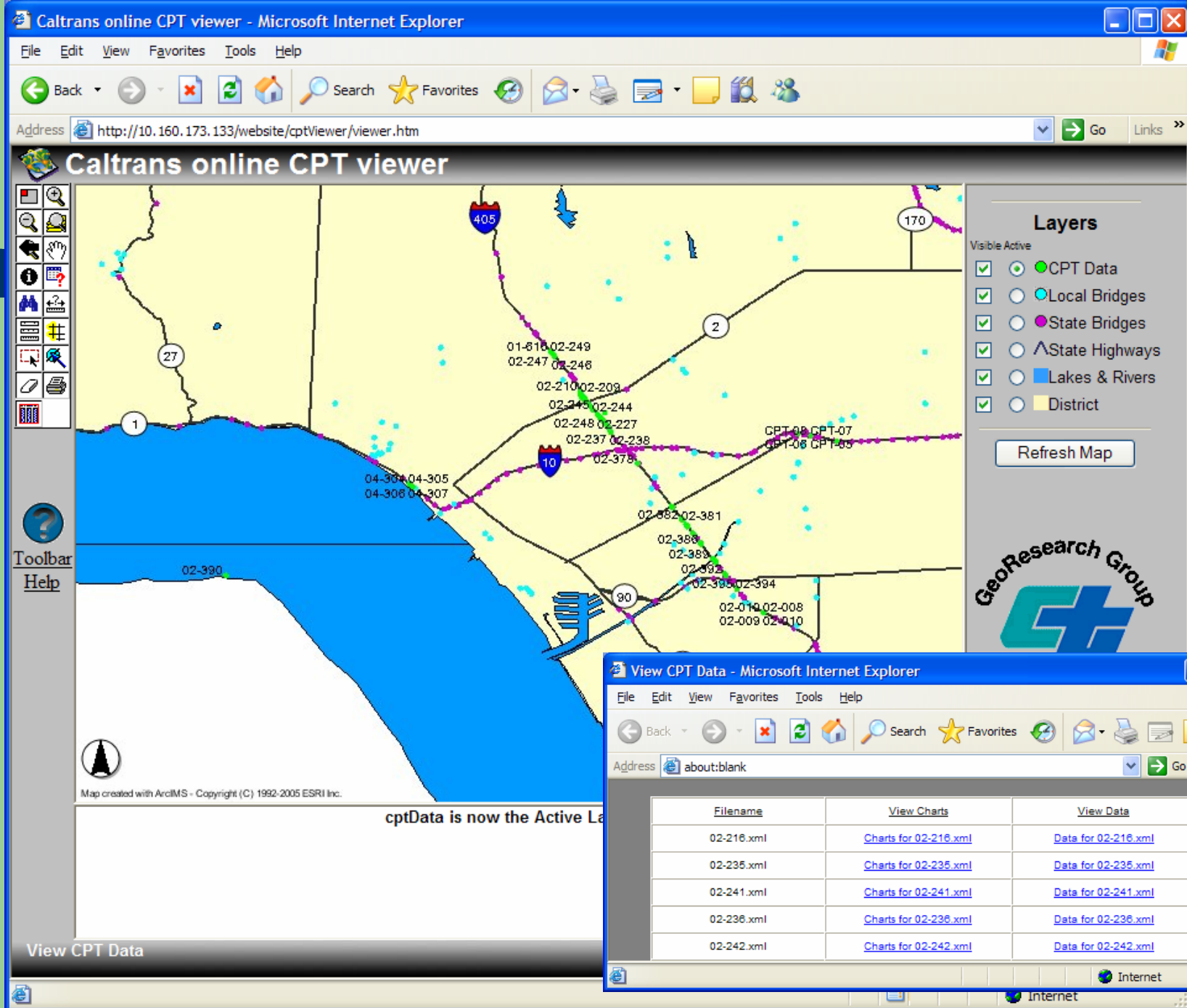


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Date: 2002-05-02

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Long: -118.44888

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Hole ID: Caltrans_05022002_07-195901_OHIO-S-3
Cone Type: 777 TC





Coming Soon
Search Features**Contacts****Site Contacts:**

- [Frank Squire](#)
- [David Toth](#)
- [Loren Turner](#)
- [Paul Grimes](#)

Northing

 m

Easting

 m

Local Coordinate Reference System

State Plane CA Zone 1 (Nad 83)

Horizontal location (station offset):

Enter station offset data:

Vertical location:

Elevation

 m

Datum

Nad 83

Cone Information:[Collapse](#)

Cone ID

774 TC

Cone Type

ELECTRIC CONE 10 TON

Manufacturer

Hogentogler

Tip Area

10 cm²

Tip Angle

60 degrees

Friction Area

150 cm²

Tip-Sleeve Distance

0 cm

Piezou Type

Type 1

Porous Type

other

Fluid Type

water

Saturation

Area Ratio

0

Rod Type

A-rod

Friction Reducer

water

Penetration Rate

20 cm²

Tip Capacity

1044 TSF

Sleeve Capacity

10.44 TSF

Surface Cell Capacity

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Pore Capacity

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Date

Remarks

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File Edit View Favorites Tools Help



Address http://10.160.173.133/XML2SVG/

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File Edit View Favorites Tools Help



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Done

Internet

Technologies

- Programming
 - ASP.net
 - SVG
 - Access
 - ArcIMS
- Server
 - Windows 2003 Server
 - Windows IIS & Tomcat

Becoming a Data Provider: Caltrans Experience

**Workshop on the Implementation of
COSMOS/PEER-LL GVDC**

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Loren Turner, Caltrans

Becoming a Data Provider: CGS Experience

**Implementation of the
COSMOS/PEER-LL GVDC**

October 5, 2005

Charles Real and Terilee McGuire

SHMP, California Geological Survey

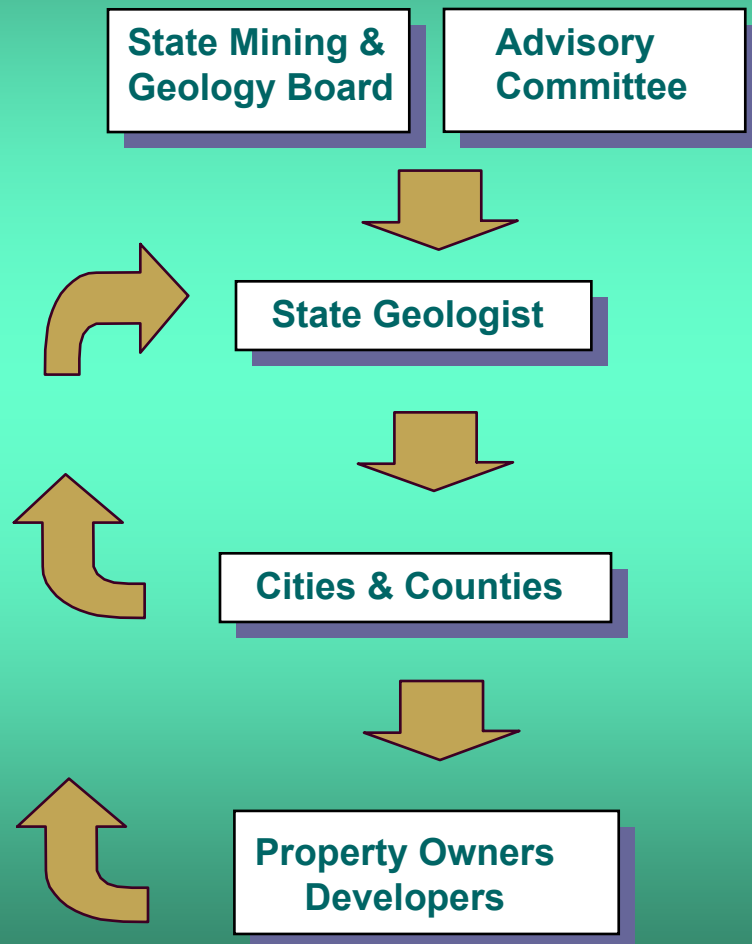
Jennifer Swift

Department of Civil and Environmental Engineering, USC

Purpose of Geotechnical Database

- Support Designation of Regulatory Seismic Hazard Zones
 - Analysis of Ground Shaking Hazard
 - Analysis of Earthquake-Induced Ground Failures
- Update/Revise Seismic Hazard Zones

Seismic Hazards Mapping Act



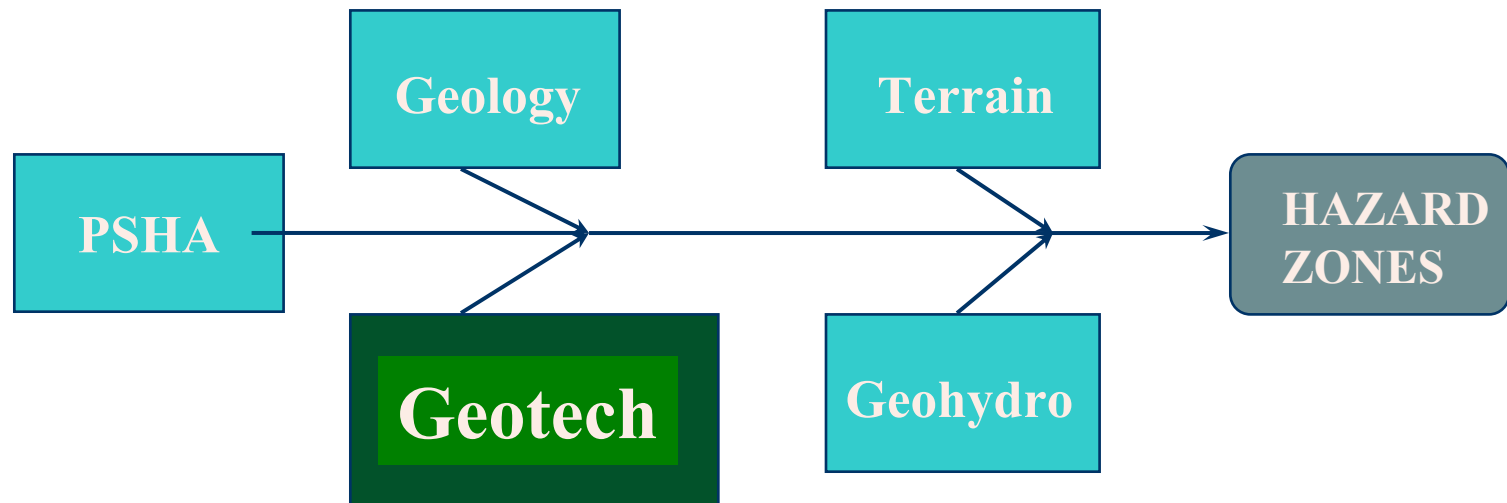
- **Adopts Mandated Policies**
- **Provides Technical Advice**

- **Evaluates Regional Seismic Hazard**
- **Designates Seismic Hazard Zones**
- **Provides Advisory Services**

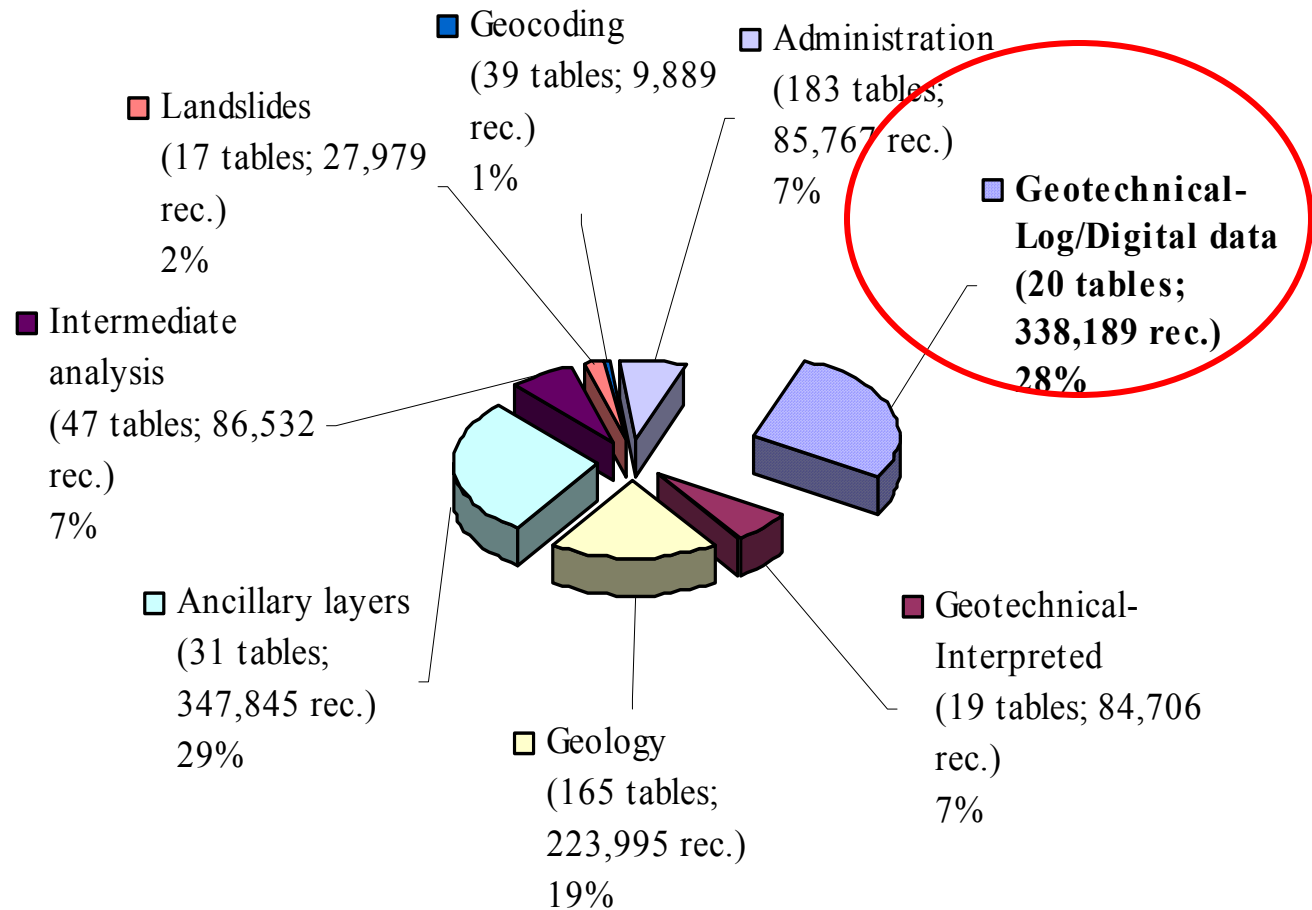
- **Requires Site Investigations**
- **Updates General Plans**
- **Approves Project**

- **Determines Hazard at Site**
- **Mitigates Hazard**
- **Discloses**

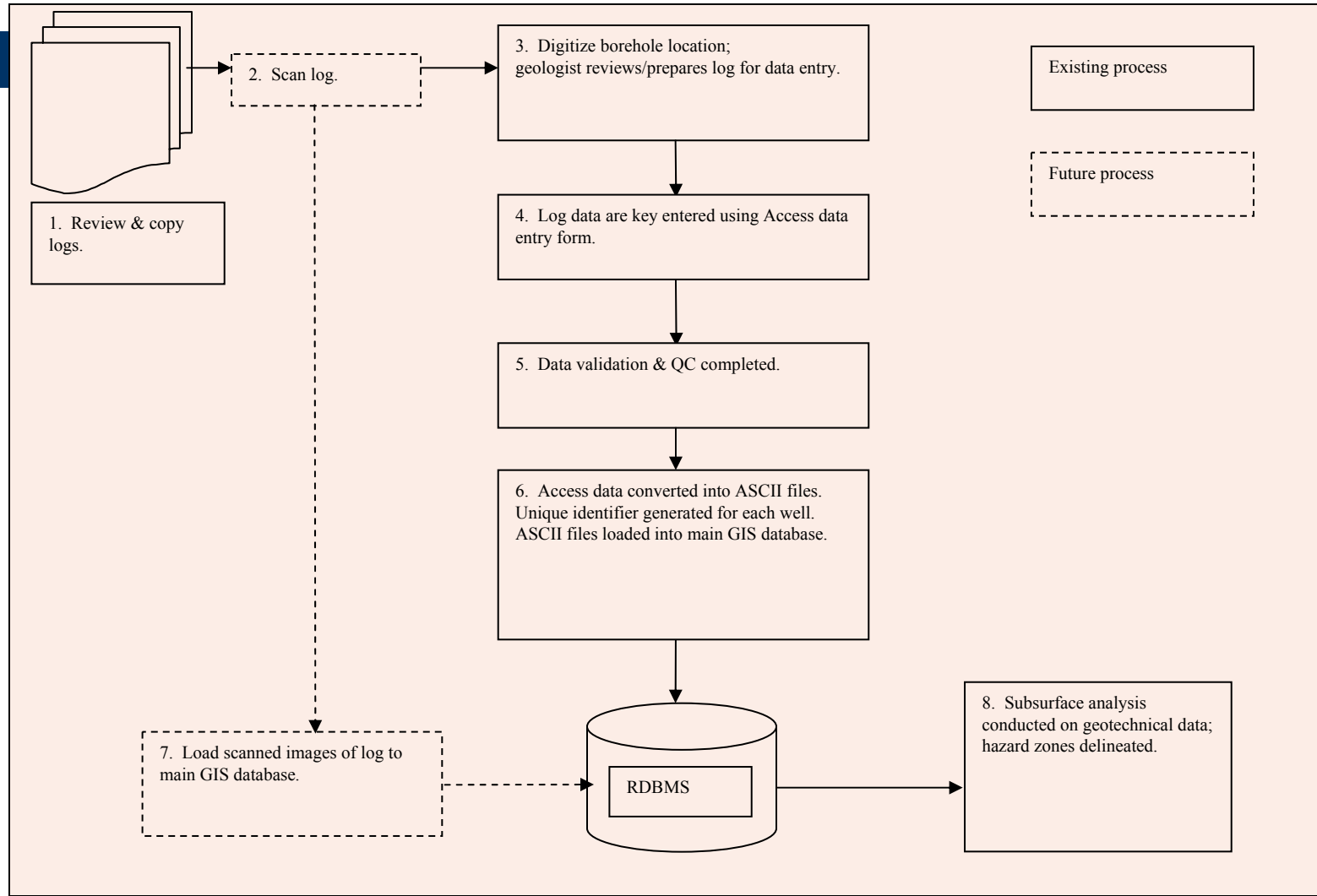
Data Requirements for Seismic Zonation



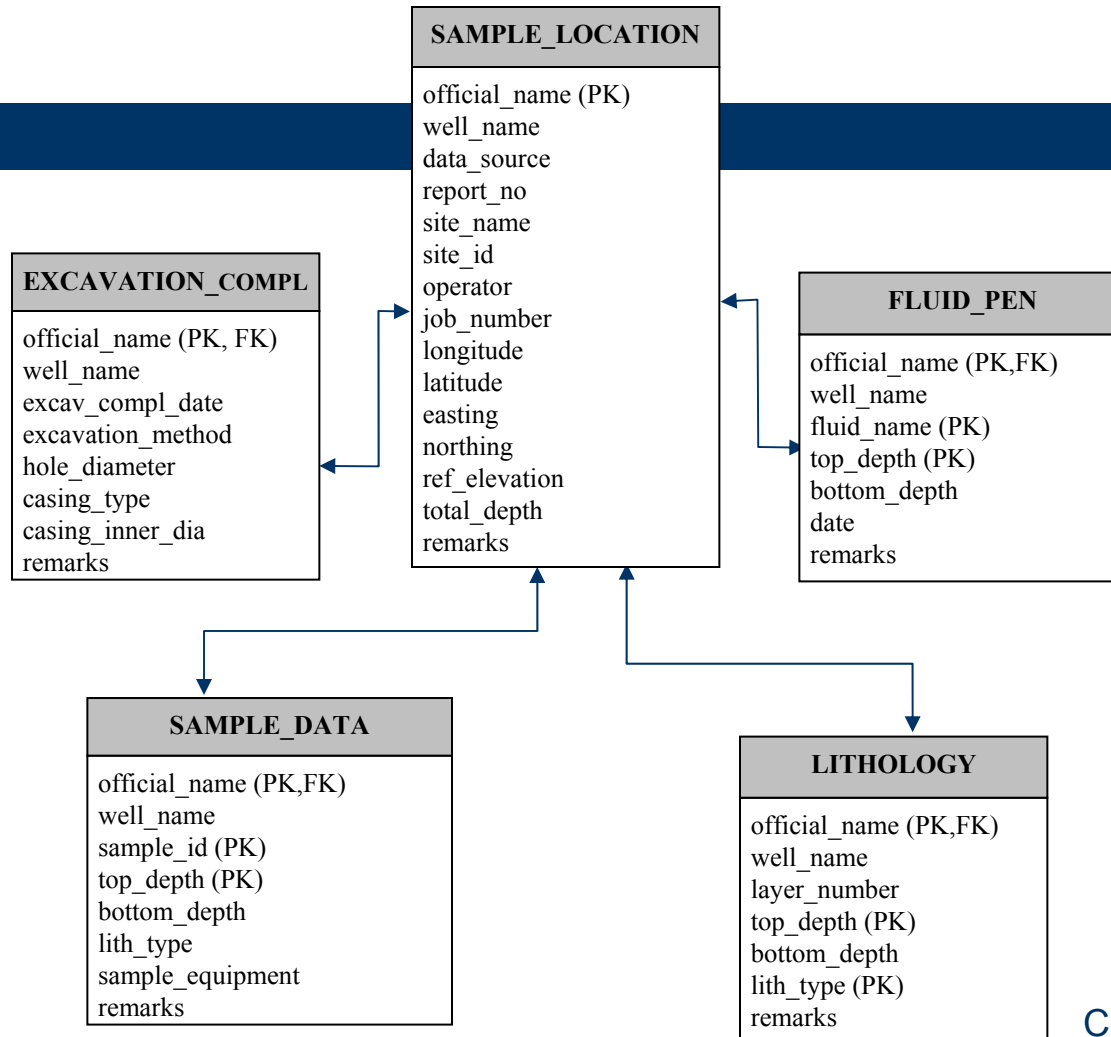
Program Database Information Categories



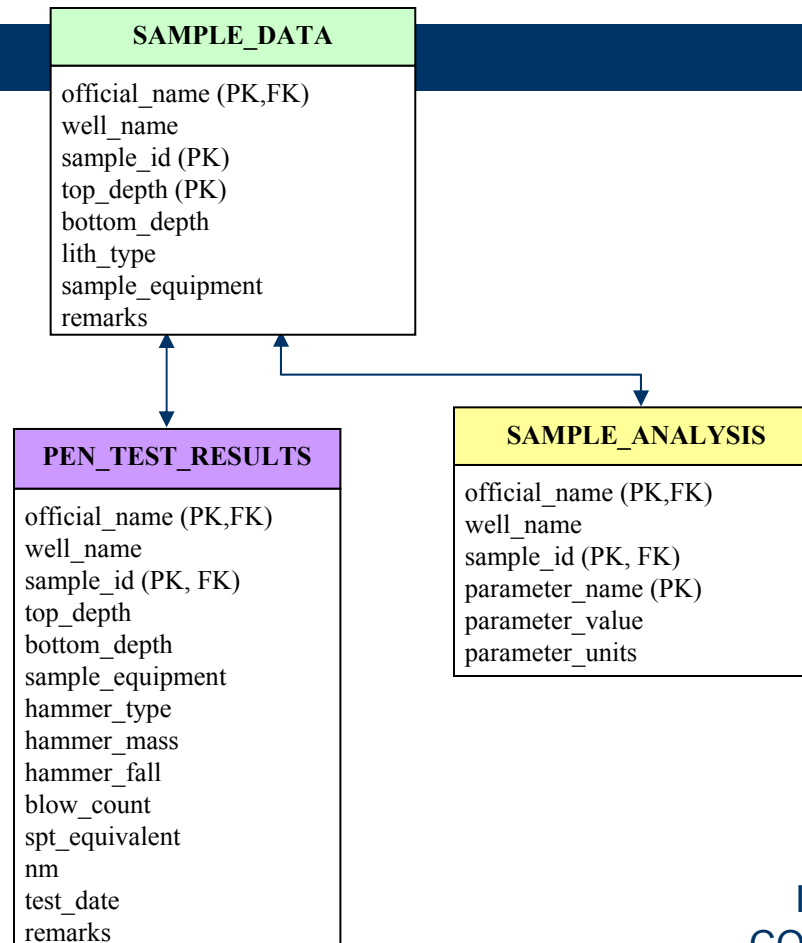
Log Capture Process



External Data Model



Data Model (cont.)



Seismic Hazard Zonation of Southern California October 2003



MAP EXPLANATION

Zones of Required Investigation

-  **Liquefaction**
Areas where historic occurrence of liquefaction, or local geologic, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 26009(c) would be required.
-  **Earthquake-Induced Landslides**
Areas where past or potential occurrence of landslide movement, or local topographic, geologic, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 26009(c) would be required.

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SEISMIC HAZARDS MAPPING PROGRAM
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Ventura County

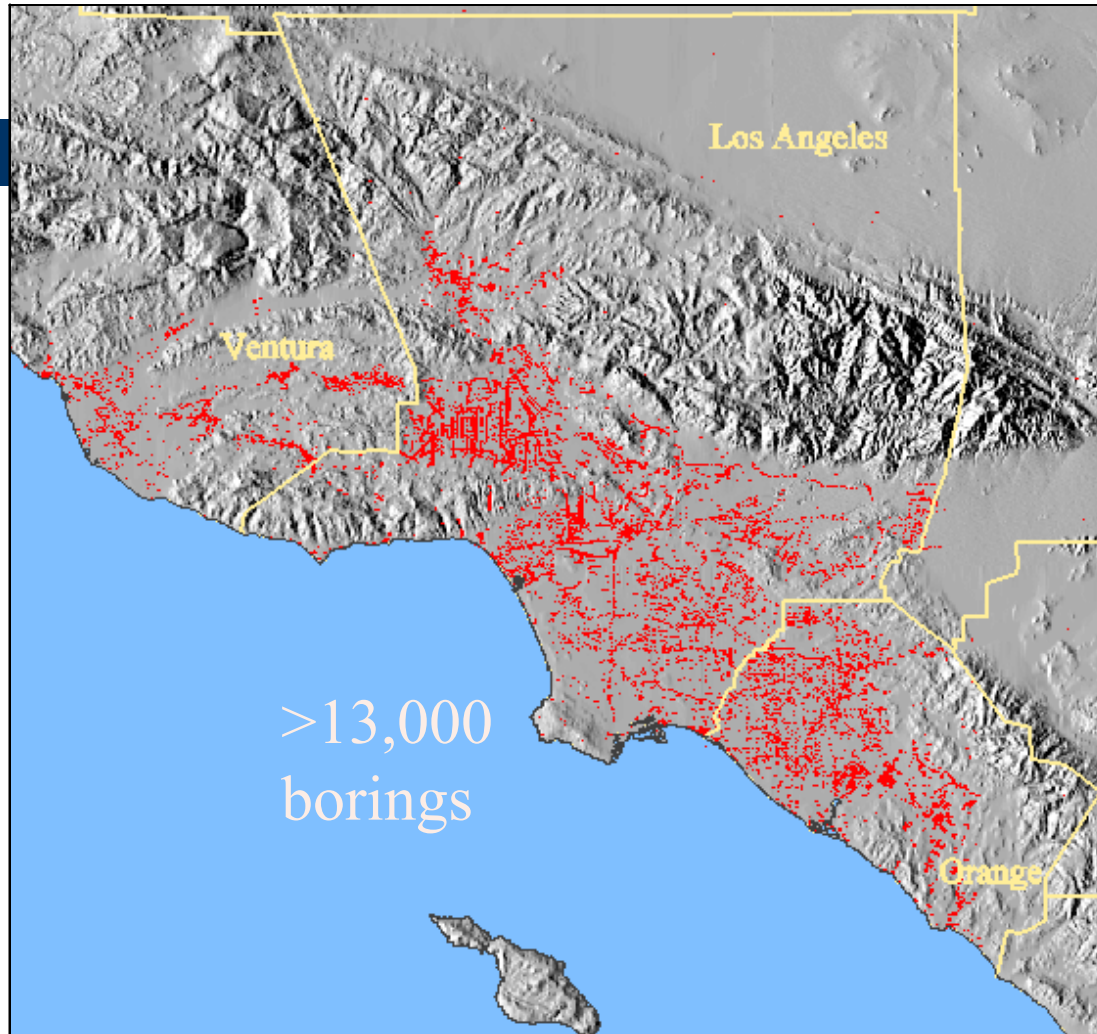
Los Angeles County

Orange County

Pacific Ocean

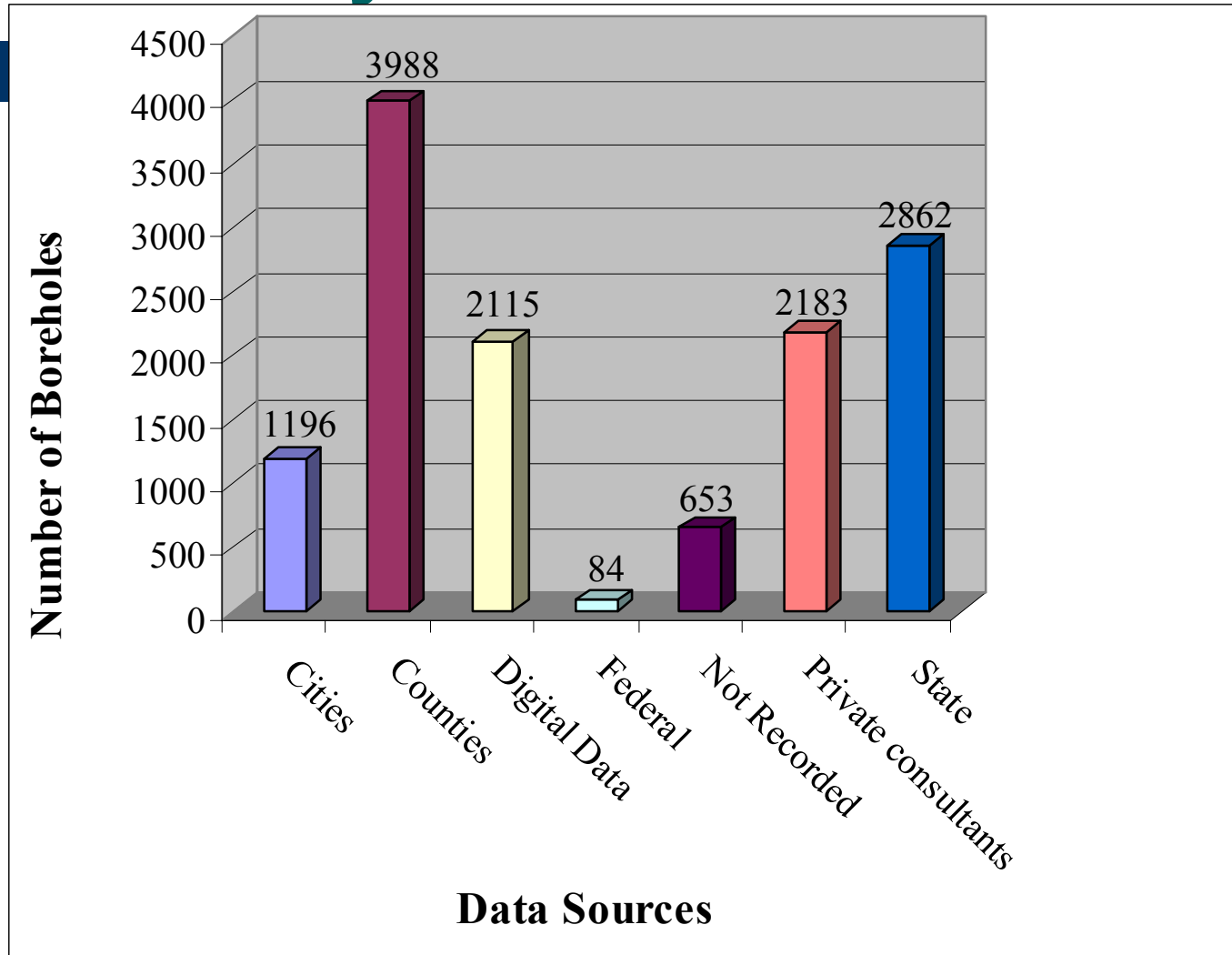


Southern California Data

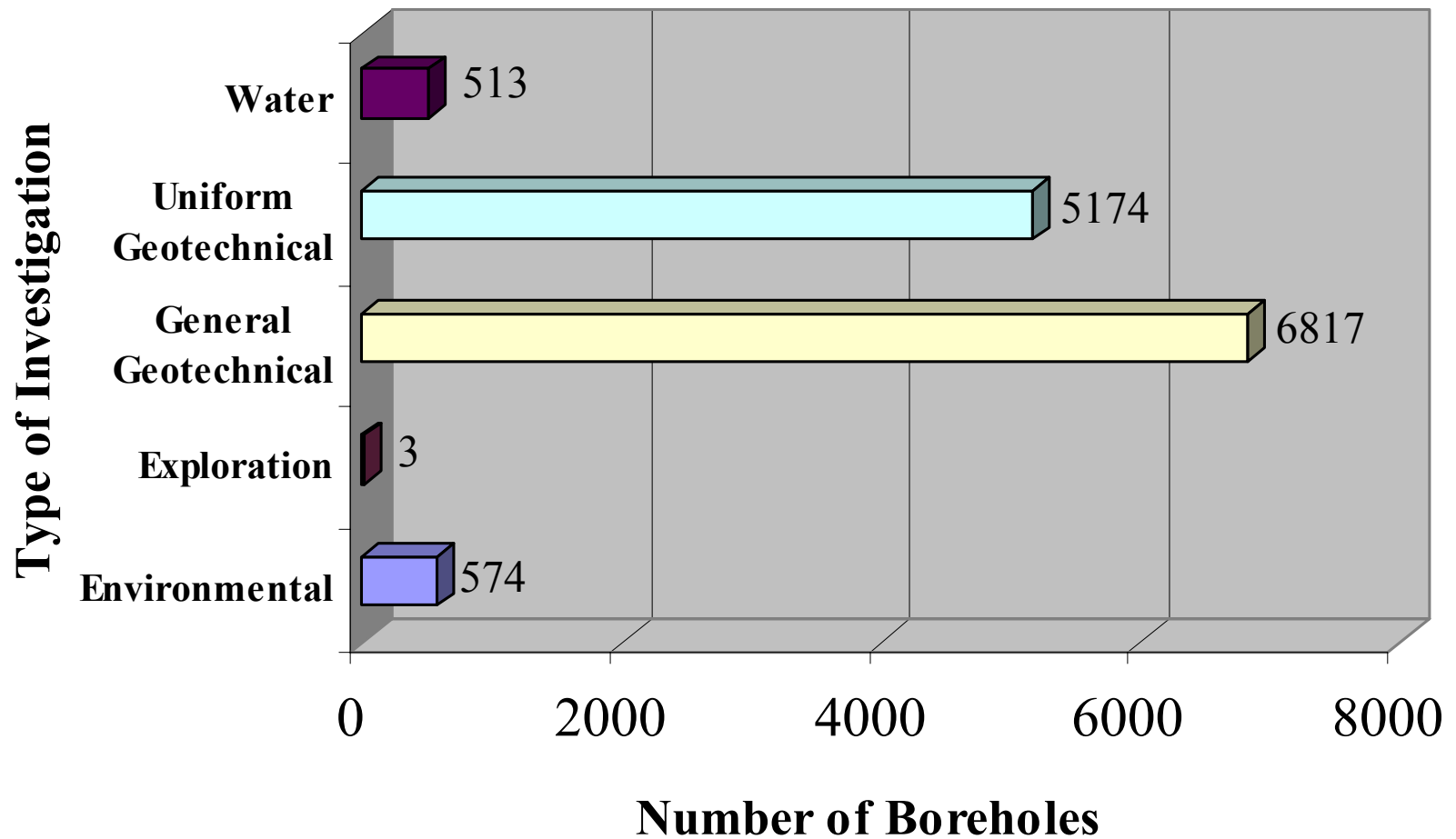


Implementation of the
COSMOS/PEER-LL GVDC
10/05/05

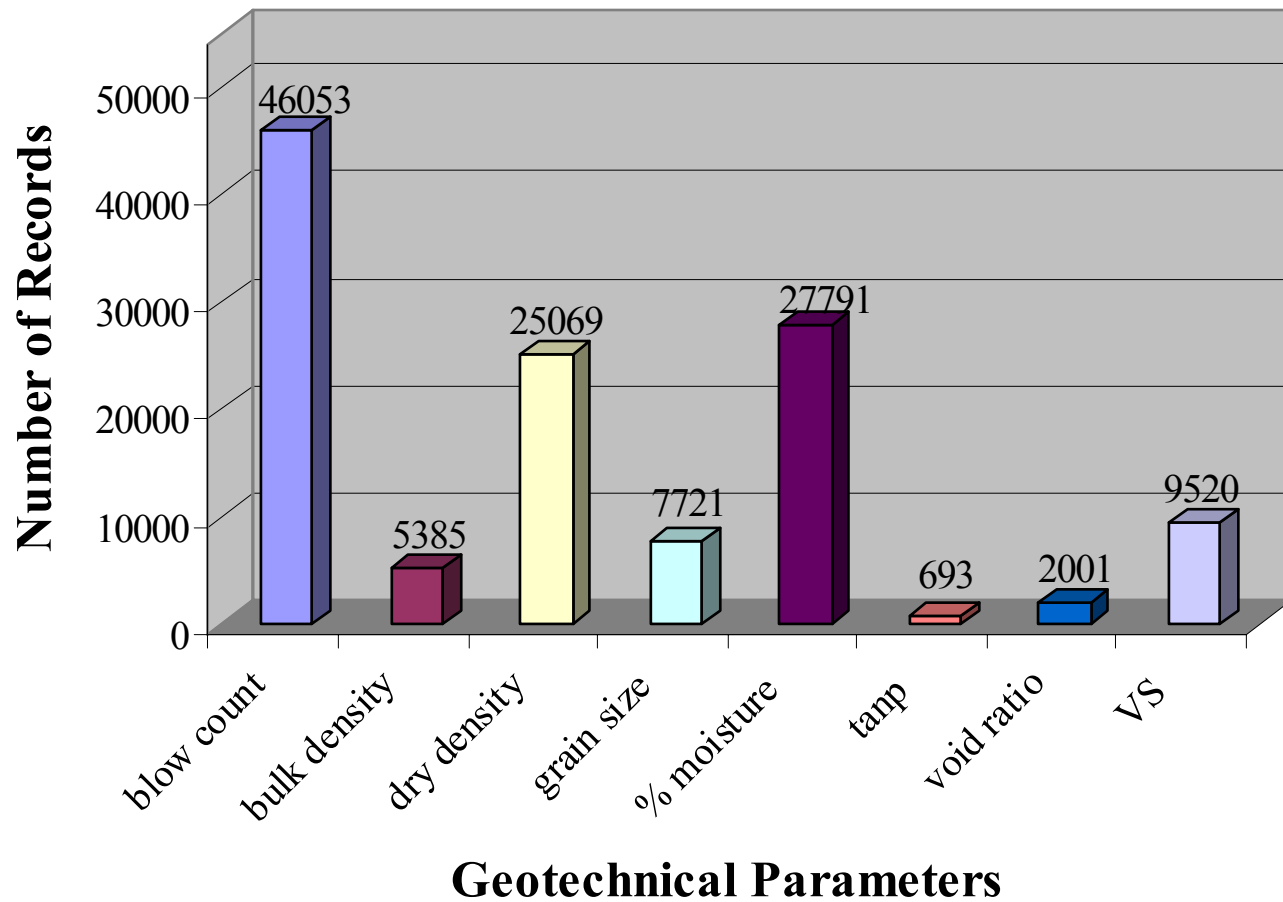
Socal Data by Source

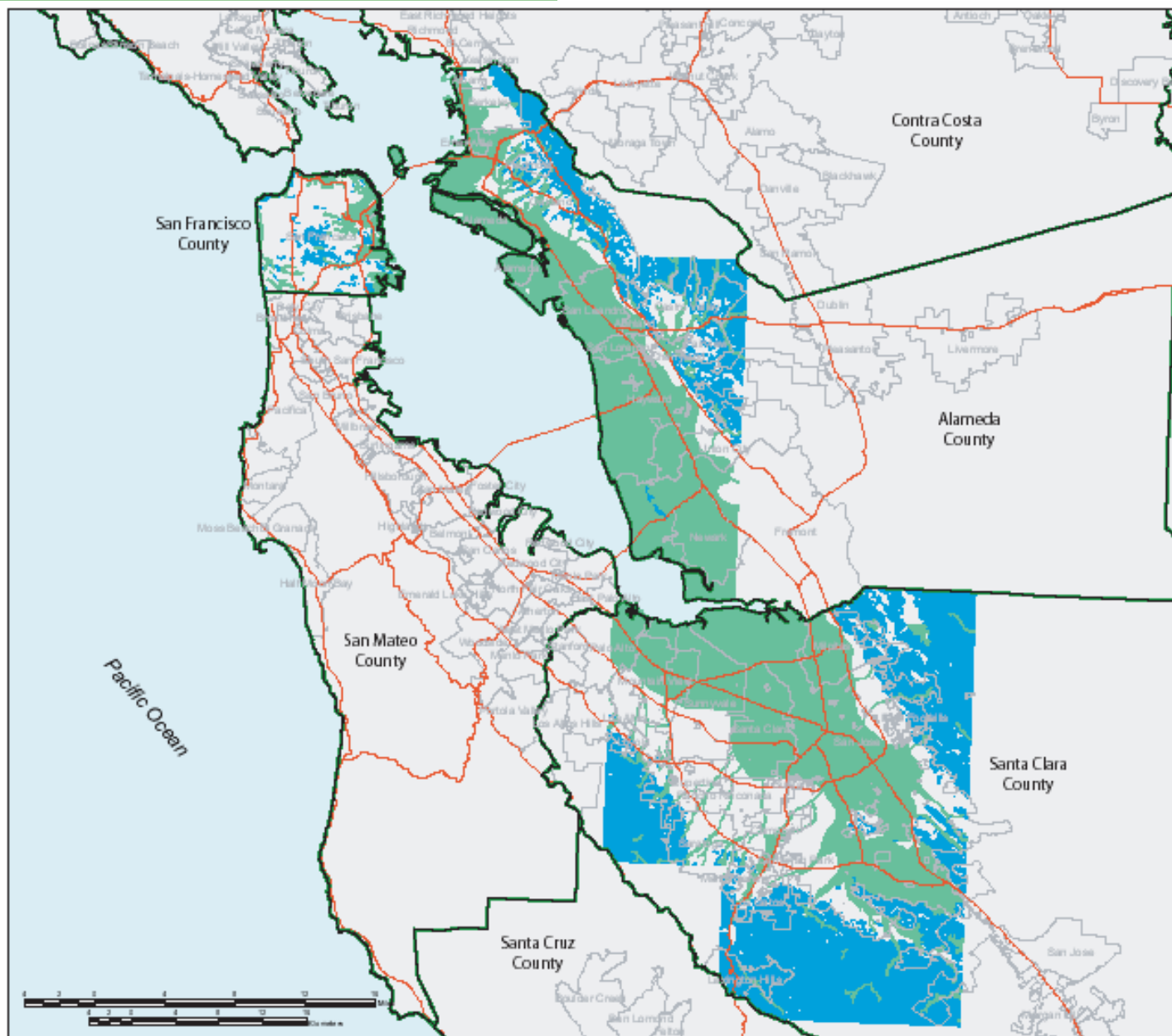


Socal Data by Type



Socal Data Parameters





Seismic Hazard Zonation of Northern California October 2003



MAP EXPLANATION

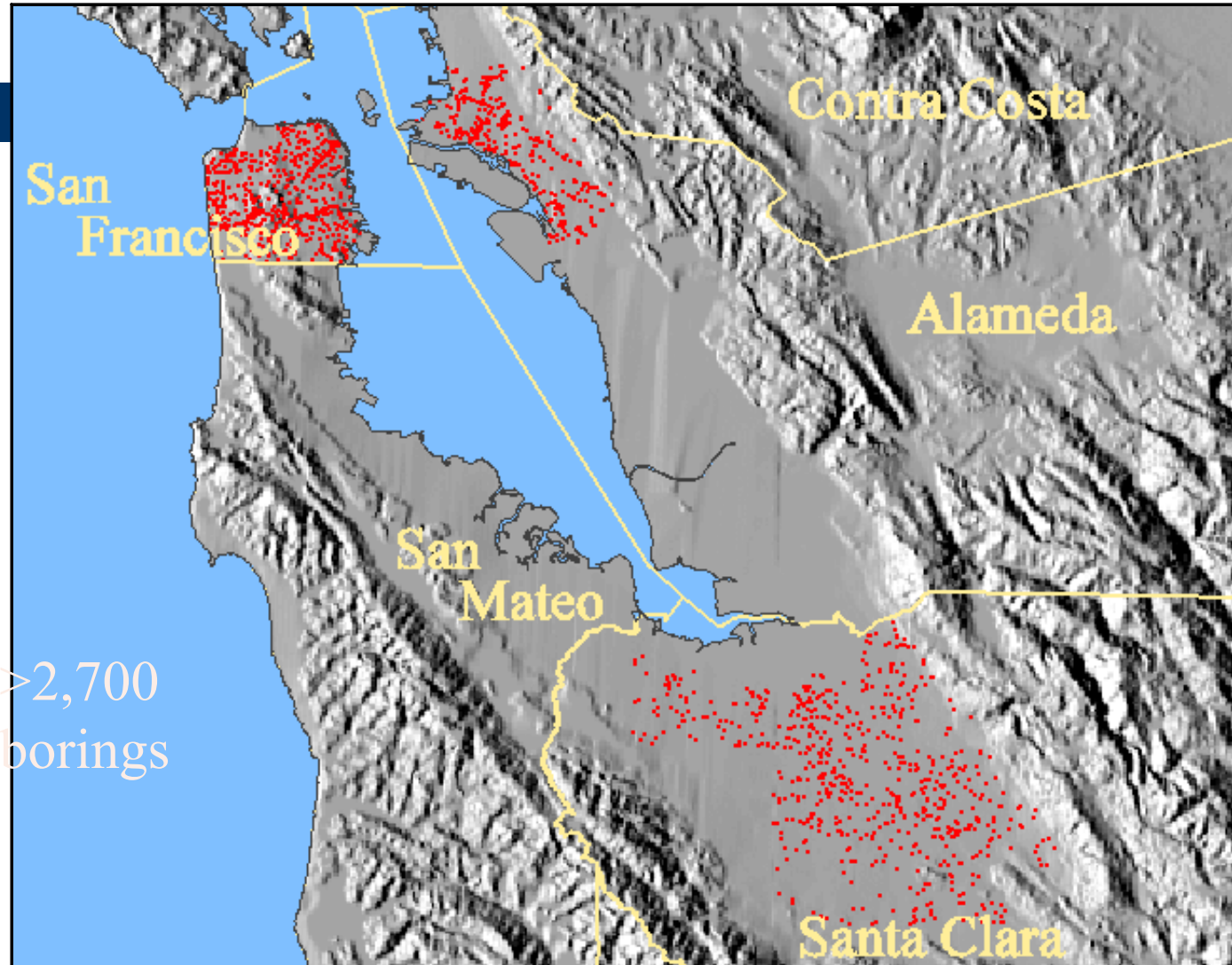
Zones of Required Investigation

- Liquefaction**
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2600(c) would be required.
- Earthquake-Induced Landslides**
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2600(c) would be required.

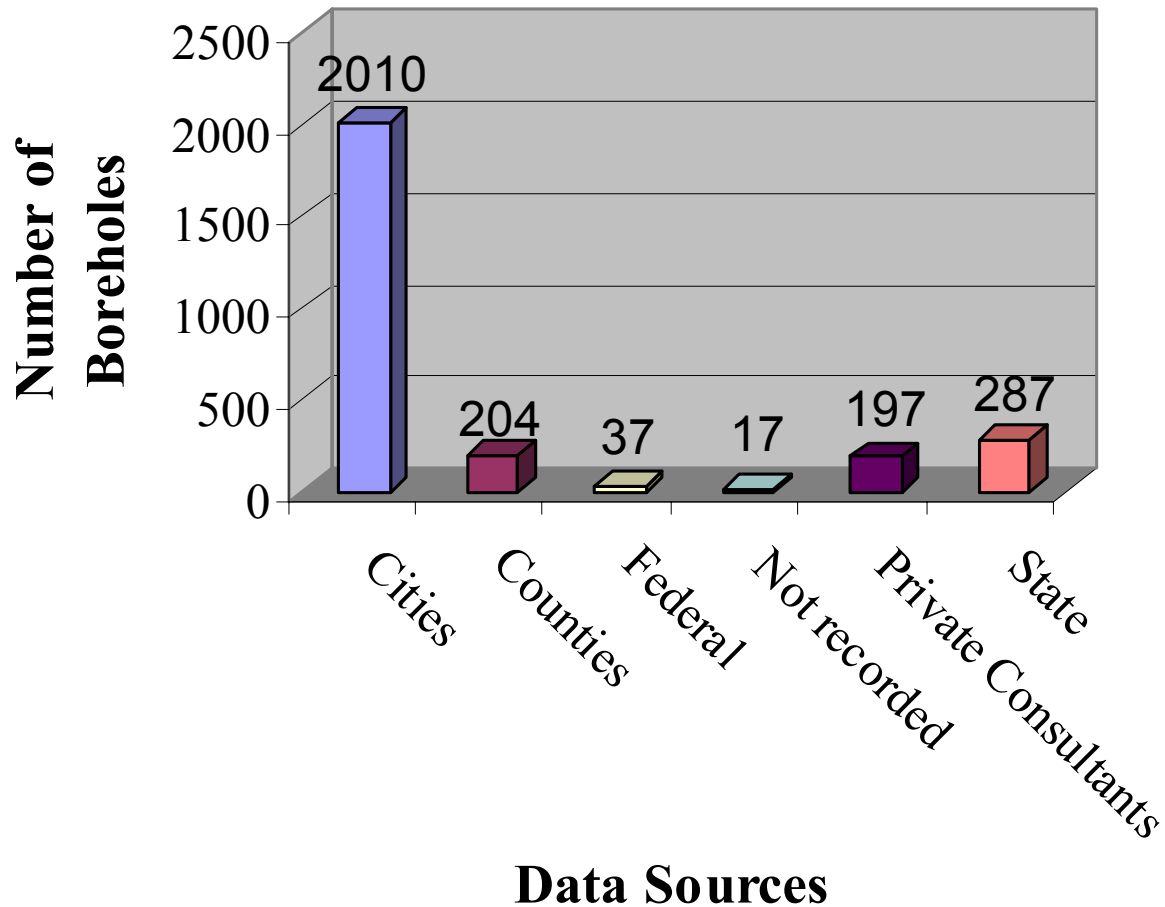
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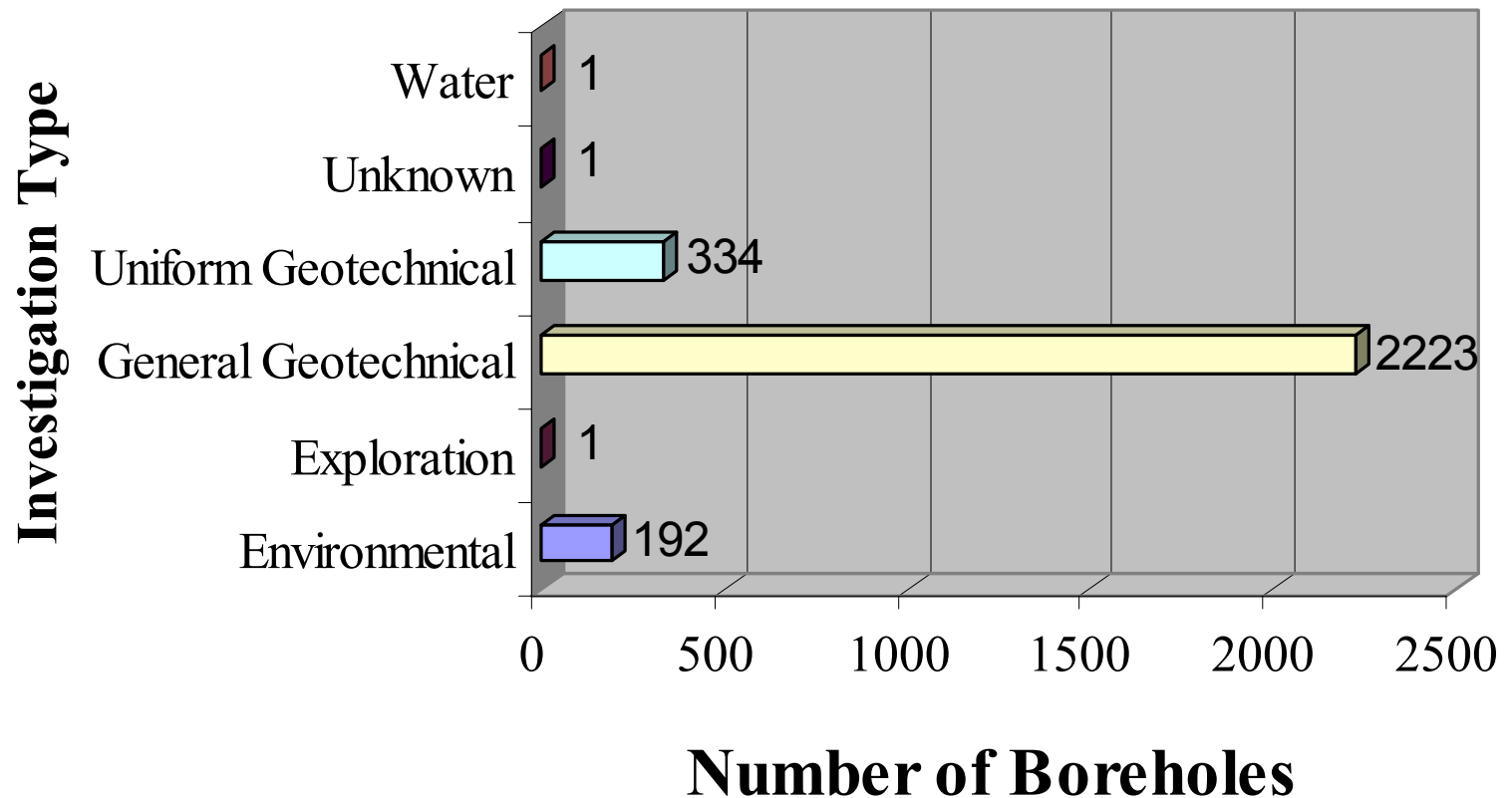
Northern California Data



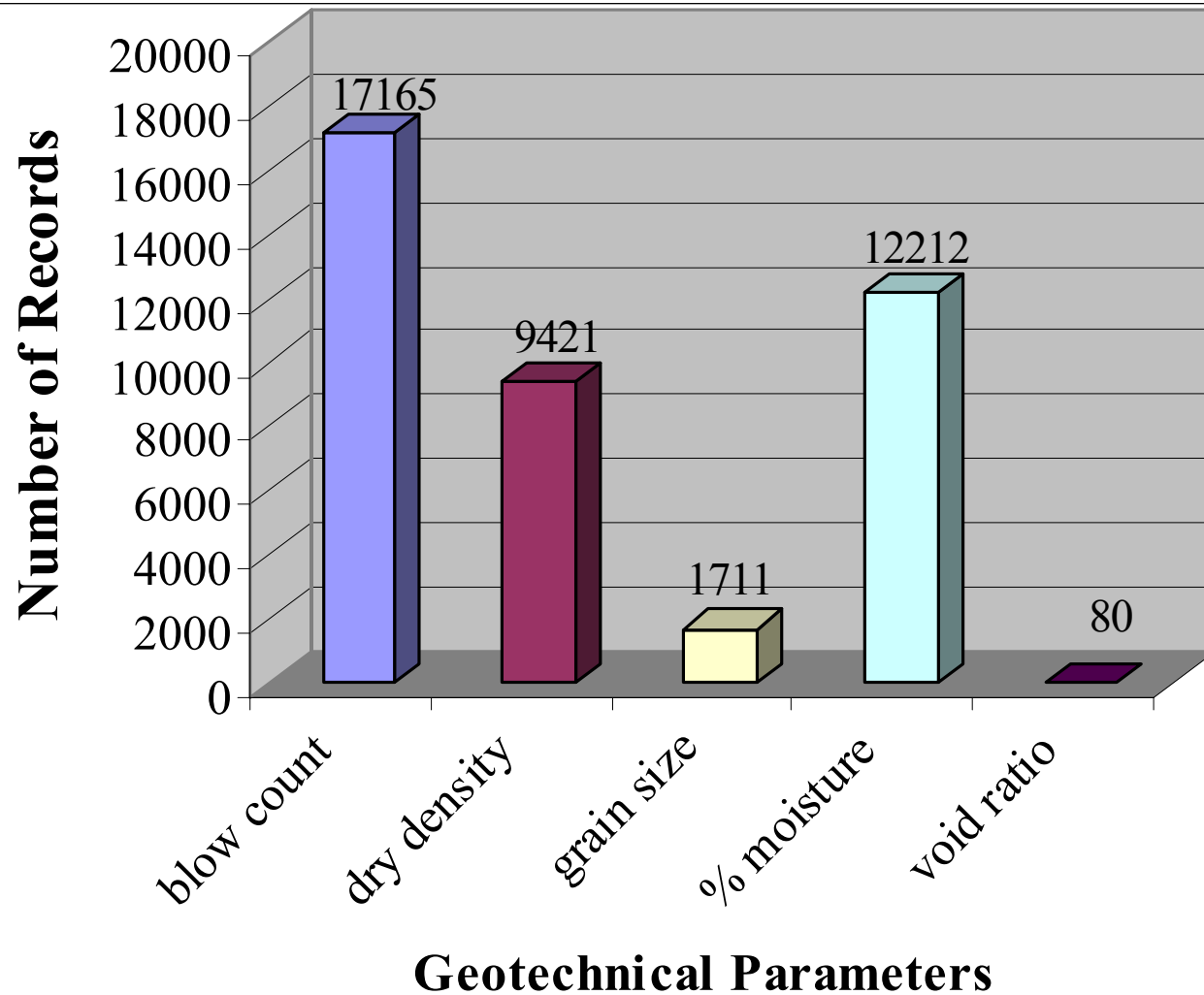
Norcal Data by Source



Norcal Data by Type



Norcal Data Parameters



Web-enabled GIS Access - SHMP

- GeoMedia WebMap®
- Select Data Theme
- Map-based Queries
- Text-based Queries
- Spatial Queries
- Ad-Hoc Mapping
- Download Function

Digital Data Themes - SHMP

★ Available

Geologic Materials

Topography

Historic High Groundwater

Adverse Bedding

Borehole Locations & Metadata

Hazard Inventory

Hazard Susceptibility

Hazard Potential

Hazard Zone

← Soon

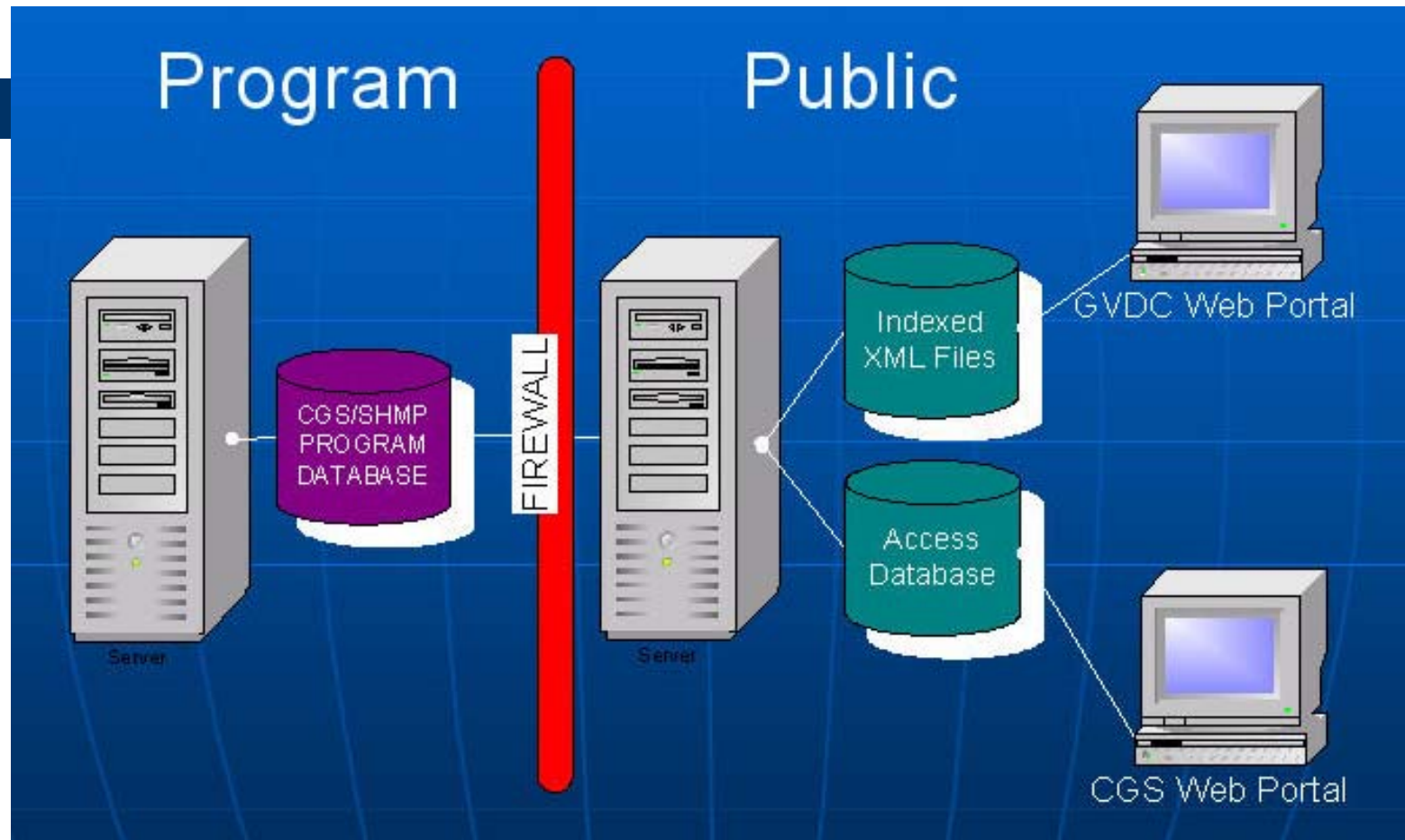
★ Available

Web



Implementation of the
COSMOS/PEER-LL GVDC
10/05/05

GVDC Implementation

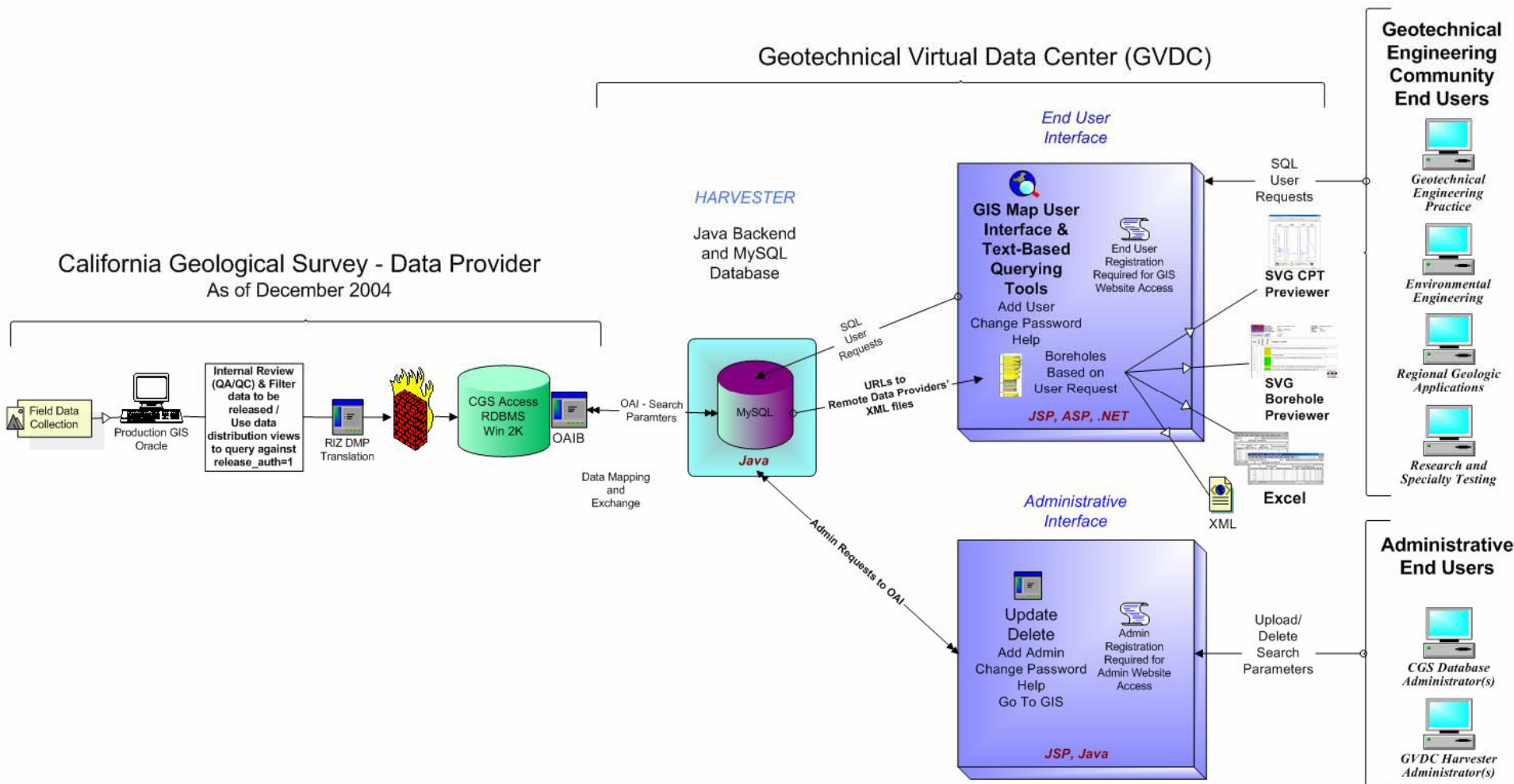


Implementation of the
COSMOS/PEER-LL GVDC
10/05/05

CGS Geotechnical Data Translator

- **MS Access Visual Basic Applications (VBA's)**
- **CGS Translator performs the following functions:**
 - Updates the SHMP Web Map Application Access database tables to include information required by the GVDC
 - Converts CGS geotechnical data and associated metadata in MS Access tables into XML files
 - Stores CGS XML file URLs in a table in database
 - Saves CGS XML files on a “remote” hard drive

Connecting To The GVDC



Questions..?
